1-1-2007

Older Adults' Food Choices Associated With Cardiovascular Health

Sondra J. Clarkson
Eastern Illinois University

OLDER ADULTS' FOOD CHOICES ASSOCIATED WITH CARDIOVASCULAR HEALTH

CLARKSON

THESIS REPRODUCTION CERTIFICATE

TO: Graduate Degree Candidates (who have written formal theses)

SUBJECT: Permission to Reproduce Theses

The University Library is receiving a number of request from other institutions asking permission to reproduce dissertations for inclusion in their library holdings. Although no copyright laws are involved, we feel that professional courtesy demands that permission be obtained from the author before we allow these to be copied.

PLEASE SIGN ONE OF THE FOLLOWING STATEMENTS:

Booth Library of Eastern Illinois University has my permission to lend my thesis to a reputable college or university for the purpose of copying it for inclusion in that institution's library or research holdings.

Sandra J. Clarkson 12/12/07

Author's Signature Date

I respectfully request Booth Library of Eastern Illinois University **NOT** allow my thesis to be reproduced because:

_____

_____

_____

_____ _____

Author's Signature Date

This form must be submitted in duplicate.

Older Adults' Food Choices Associated with Cardiovascular Health
(TITLE)

BY

Sondra J. Clarkson

THESIS

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF

Master of Science

IN THE GRADUATE SCHOOL, EASTERN ILLINOIS UNIVERSITY
CHARLESTON, ILLINOIS

2007
YEAR

I HEARBY RECOMMEND THAT THIS THESIS BE ACCEPTED AS FULFILLING
THIS PART OF THE DEGREE CITED ABOVE

12-4-07
DATE

Karla Kennedy Hagan
THESIS DIRECTOR

12-10-07
DATE

DEPARTMENT/SCHOOL HEAD

12-4-07
DATE

Kathleen O'Rourke
COMMITTEE MEMBER

12/4/07
DATE

COMMITTEE MEMBER

Dedication

I would like to dedicate this thesis to my family. Without their support and encouragement I would not be who I am today. I would like to make a special dedication to my sister who led me into the field of healthcare so that I can make a difference in the quality of other people's lives.

Acknowledgements

I would like to thank my thesis advisor, Dr. Karla Kennedy-Hagan, for all of her expertise, guidance, and time she has provided me throughout this study. I would also like to thank Dr. Kathleen O'Rourke and Dr. Martha Brown for their advice and help throughout the thesis process. I would like to express my deep appreciation and gratitude to all of my thesis committee members for their guidance and support.

I would also like to thank Peace Meal Senior Nutrition Program for providing the participants for this research study. I would also like to thank those individuals from Peace Meal who participated in my study.

Abstract

The number of older adults who develop cardiovascular disease each year continues to remain high. It is important to examine possible reasons cardiovascular disease is prevalent among older adults. The purpose of this study was to identify the food choices older adults associate with cardiovascular health. This study examined the differences in heart healthy food choices of male and female participants, white and black participants, and participants with and without known cardiovascular disease. A quantitative questionnaire and focus groups were used to gain insight on the foods older adults associate with cardiovascular disease. The participants were able to identify heart healthy foods; in fact several of the same heart healthy foods were selected regardless of being male, female, white, black, and with or without known cardiovascular disease. The participants' food choices did not significantly differ between males and females, between races, or between those with and without known cardiovascular disease. Providing nutrition education on cardiovascular health would supply older adults with the knowledge that consuming a wide variety of foods from all food groups is essential for heart health. Further studies on food choices are needed to identify additional reasons for the prevalence of cardiovascular disease in older adults.

Table of Contents

Older Adults' Food Choices Associated with Cardiovascular Health

Chapter 1

Introduction

According to the World Health Organization (2007), an estimated 17.5 million, or 30 percent of total global, deaths result from various forms of cardiovascular disease, many of which are preventable. More than 50 percent of the deaths and disability from heart disease and strokes can be cut by individual actions to reduce major risk factors. Major primary risk factors include unhealthy diet, physical inactivity, excessive alcohol consumption, and smoking. It has been estimated that improved nutrition and lifestyle could reduce illness and death from cardiovascular disease by 30 percent (US Department of Agriculture, 2000).

The first area of interest in this study was related to the older adults' ability or inability to choose foods that provide essential nutrients to reduce the risk for cardiovascular disease. A better understanding of the role of food choices is a necessary step in effectively promoting optimal health through improved nutrition. The second area of interest was related to demographics of gender, race, and cardiovascular health and identification of foods that promote cardiovascular health within the older adult population.

Statement of Problem

Older adults, age 75 and older, are the fastest growing population (Health Guidance, 2007). This is also a group of individuals most susceptible to many health risks from a nutrient-poor diet. Appropriate food choices by the older adult population is an essential factor in maintaining health and influence the incidence of age- associated diseases (Souter & Keller, 2002).

Evidence indicates that a significant number of elderly fail to get the amounts and types of food necessary to meet essential nutrient needs (Russell, Rasmussen, & Lichtenstein, 1999 and U.S Department of Health and Human Services, 2005). According to research conducted by Ferrini, Edelstein, and Barrett-Connor (1994), which focused on health behavior, older adults ages 70 to 89 reported confusion about how to stay healthy. The older adults also had a higher level of uncertainty regarding which foods to eat compared to the younger respondents ages 50 to 69.

There are many reasons why older adults eat appropriate versus inappropriate foods for heart health. Appropriate foods for heart health are rich in antioxidants, fiber, potassium, and unsaturated fats and low in saturated fat. The inappropriate foods for heart health are low in antioxidants, fiber, potassium, unsaturated fats, and high in saturated fats (Meydani, 2001). One area of interest to this researcher was the accuracy with which older adults identify foods associated with cardiovascular health; although, the researcher was unable to locate sufficient research supporting the older adults' food choices in relation to heart health. However, there is a large amount of research linking certain foods to the prevention of cardiovascular disease. Making appropriate food choices is the first step toward improving dietary intake and is directly related to nutritional well being (Souter & Keller, 2002).

Purpose of Study

The purpose of this study was to identify the food choices older adults associate with cardiovascular health.

Research Questions

This research project was guided by four research questions.

(1) How accurate are older adults in identifying foods that promote cardiovascular health?

(2) Are males or females more likely to identify foods that promote cardiovascular health?

(3) Which race is more likely to identify foods that promote cardiovascular health?

(4) How accurate are those with known cardiovascular disease and those without known cardiovascular disease at identifying foods that promote cardiovascular health?

Importance of the Study

There is little published research on the food choices older adults associate with the prevention of cardiovascular disease. Therefore, there is limited research on the effect of sex, race, or cardiovascular health status on food choices that promote cardiovascular health. This study explored the heart healthy food choices between males and females, between races, and between those with and without known cardiovascular disease to determine the older adults' accuracy in identifying foods that promote cardiovascular health.

Limitations

Limitations to this study included a convenience sample and limited time. The convenience sample consisted of participants who resided in small communities in east central Illinois. Given this limitation, generalized assumptions regarding all older adults' food choices associated with heart health

cannot be made. In addition, this research study was part of a graduate-level thesis; therefore, the time to complete the study was limited. Sample size was a limitation due to the number of older adults who participated in the senior nutrition program.

Assumptions

The researcher's assumptions regarding this research were as follows:

(1) A population of older adults was available to provide volunteers for this study.

(2) Potential participants were willing and able to volunteer for this study.

(3) Selected participants were able to comprehend the questionnaire and focus group session in order to respond to the best of their ability.

Definitions

The following terms were used in this study and are defined as follows:

Older Adults- In this study, the sample was obtained through a senior nutrition program of older adults age 60 and over with a spouse of any age. In this study, older adults were considered to be 55 years of age and older.

Cardiovascular Disease- Diseases of the heart and blood vessel system including the arteries, capillaries, and veins within a person's entire body, according to the U.S. Department of Health and Human Services (United States Department of Health and Human Services, 2002).

Foods Associated with the Prevention of a Cardiovascular Disease- Whole grains, fresh fruits and vegetables, low fat dairy products, lean meats, and unsaturated fats (Meydani, 2001).

Chapter 2

Literature Review

There are many reasons why older adults develop cardiovascular disease including inappropriate dietary behaviors. More specifically, the consumption of high fat foods, the lack of fresh fruits and vegetables, inadequate micronutrients, and high caloric foods has been linked to cardiovascular disease. The consumption of inappropriate foods can be due to a multitude of reasons. One reason includes failure to choose the appropriate foods which promote cardiovascular health. This literature review will cover the prevalence of cardiovascular disease among the older adult population and illustrate through several research studies how heart-healthy nutrition can have a significant role in the prevention of cardiovascular disease. This literature review will also cover the differences in dietary patterns in sex, race, and those who have and do not have cardiovascular disease and how these patterns relate to cardiovascular health.

Older Adults and Cardiovascular Disease

Currently, 35 million people 65 years of age and older live in the United States. These older adults account for nearly 13 percent of the population. Older adults are the fastest growing population and by the year 2030, one in every five people will be 65 years or older (US Census Bureau, 2006).

The American Heart Association Statistics (2006) report heart disease as the number one cause of death among older adults. In fact, 83 percent of cardiovascular disease deaths occurs in people age 65 and older. Stroke is a leading cause of serious and long-term disability in the United States. Roughly 88 percent of stroke deaths occur in people age 65 and older. In addition, more than

70 million Americans currently live with a cardiovascular disease (Centers for Disease Control and Prevention, 2006). For these reasons, promoting cardiovascular health in the elderly is important. To promote cardiovascular health, research is needed to assess the extent to which nutrition knowledge is evident.

Aging and Nutrition Intervention

Age is the major risk factor for cardiovascular disease. The incidence for heart disease and stroke increases after age 65. People age 65 and older are much more likely to suffer a heart attack, to have a stroke, or to develop coronary heart disease compared to people under the age of 65. Cardiovascular disease is also a major cause of disability, limiting the activity and damaging the quality of life of millions of older adults each year (Hodes, 2007).

With aging, the incidence of disability increases due to chronic conditions. Nutrition is an important lifestyle factor in the aging process. Food patterns associated with good health reduce the occurrence and duration of chronic diseases. According to Wahlqvist and Savige (2000), assessing knowledge is a practice used to identify older adults' ability to choose health-promoting foods.

Nutrition remains important throughout life. Many chronic diseases that develop late in life, such as cardiovascular disease, can be influenced by poor habits. Proper nutrition in the later years still can help lessen the effects of diseases prevalent among older adults or improve the quality of life in people who have such diseases. A good diet in later years helps both in reducing the risk of these diseases and in managing the diseases' signs and symptoms. This

contributes to a higher quality of life, enabling older people to maintain their independence by continuing to perform basic daily activities (Kurtzwell, 2007).

Older adults may have compromised intakes of food and nutrients that place them at nutritional risk without evidence of clinical malnutrition. Compromised nutritional status has been associated with increased risk for morbidity and mortality. Dietary intervention has been effective in treating and reducing risk of diseases, such as cardiovascular disease (Bailey, Mitchell, Miller, Still, Jensen, Tucker, et al., 2007). Before dietary intervention, practitioners need to identify the nutrition-related area(s) older adults need the most education.

In many age-associated diseases, nutrition plays an important role. Key nutrients associated with cardiovascular health include folate, fiber, potassium, omega-3 fatty acids, and the antioxidant vitamins C, A, and E, and vitamin B6. Common foods that contain the important nutrients include whole wheat bread products, fresh fruits and vegetables, low fat diary products, lean meat, fish, and unsaturated fats (Meydani, 2001). This literature review will indicate how specific nutrients found in certain foods have positive effects on cardiovascular health among older adults.

Whole Grains and Cardiovascular Health

There is an increasing body of evidence suggesting a strong inverse relationship between increased consumption of whole grain foods and reduced risk of cardiovascular disease. This evidence has translated into specific dietary recommendations in the US to consume at least three servings of whole grains per day and has led to the development of specific health claims for whole grain foods (Seal, 2006).

Within the bread, cereal, rice and pasta group, choices should be primarily among those that are whole-grain, enriched and/or fortified. These choices are particularly important to the elderly because the bread and cereal group comprises the bulk of their diet (Tucker & Rush, 1992). Consumption of whole grains is related to a lower risk for cardiovascular disease. This observed relationship could be explained by the many nutrients, such as folate, fiber, vitamin E, vitamin B6, minerals, antioxidants, and phytochemicals that are found in whole grain foods which may reduce chronic disease risk (Jensen, Koh-Banerjee, Hu, Sampson, Franz, Gronbaek, et al. 2004). Enriched grains are now fortified with folic acid. Folate fortification benefits the elderly by lowering blood homocysteine levels, resulting in a potential reduction in risk of homocysteine-related cardiovascular disease (Tucker, Mahnken, & Selhub, 1996). In addition, the elderly should also choose fiber-rich whole-grain bread products. Fiber has been associated with lowering low-density lipoprotein cholesterol, thus reducing the risk of cardiovascular disease (Marlett, McBurney, & Slavin, 2002). According to Sahyoun, Jacques, Zhang, Juan, and McKeown (2006), older adults between the ages of 60 and 98 who consume three or more servings of whole grain products tend to have lower blood sugar levels, lower blood pressure, lower cholesterol levels, and weigh less than those who do not consume whole grains.

Grains are staple foods in most societies. Typically, grains are consumed either in whole intact form or as flours produced from grinding or milling. Milling removes the outer bran layer and much of the germ. Whole grains are not as processed as white flours are. Therefore, whole grain foods are richer sources

of many nutrients and phytochemicals, including complex carbohydrates, dietary fiber, minerals, vitamins, and antioxidants (Hu, 2003).

Several studies have found an inverse relationship between whole grain consumption and risk for cardiovascular disease. The Iowa Women's Health Study was a prospective cohort study comprised of 41,836 postmenopausal women between the age of 55 and 69. Data were collected via surveys pertaining to the regular consumption of foods. The researchers found a striking inverse association of whole-grain intake with the risk of death from ischemic heart disease. Major contributors of whole grain intake in this study were from dark bread, such as pumpernickel and whole-grain breakfast cereal (Jacobs, Meyer, Kushi, & Folsom, 1998).

According to Liu, Stampfer, and Hu (1999), The Nurse's Health Study began in 1984 and consisted of 75,521 women aged 38-63 with no previous history of cardiovascular disease. The women completed a semiquantitiave food frequency questionnaire and were followed for 10 years. They completed the questionnaire again in 1986 and in 1990. After the 6-year follow-up, a strong inverse association was found among whole-grain intake and the risk of coronary heart disease. To understand the relation further, the researchers examined individual foods that contributed to whole-grain consumption. A significant inverse association with coronary heart disease was observed for whole-grain breakfast cereals, brown rice, popcorn, and bran (Liu, et al., 1999).

In another prospective cohort study conducted by Mozaffarian, Kumanyika, Lemaitre, Olson, Burke, and Siscovick (2003), a 99-item food frequency questionnaire was utilized to assess the participant's usual dietary

intake. The researchers randomly recruited 5201 men and women over the age of 65 and free of cardiovascular disease from 1989 to June 2000. During the 11-year follow up, when cardiovascular disease events were evaluated, higher cereal fiber intake was associated with lower risk of ischemic heart disease. The intake of certain foods such as wheat, rye, or pumpernickel was associated with the lowest risk of cardiovascular disease.

Fruits, Vegetables, and Cardiovascular Health

Fruits and vegetables contain many vitamins and minerals that are necessary for cardiovascular health. These nutrients include carotenoids, potassium, folate, fiber, and vitamins C, A, B6 and E (U.S Department of Agriculture, 2000). Many of these nutrients help lower blood cholesterol, blood pressure, and homocysteine levels, as well as protect against low-density lipoprotein cholesterol oxidation. Various fruits and vegetables provide nutrients that may also relax blood vessels, decrease platelet aggregation, and reduce inflammation (Lampe, 1999).

Within the vegetable group, food choices should be among those that have a deep color. Dark green, orange or yellow vegetables, such as spinach, peppers, carrots, squash, and garlic are optimal choices. Cruciferous vegetables including beets, kale, cabbage and broccoli contribute heart healthy antioxidant phytochemicals (Russell, Rasmussen, & Litchtenstein, 1999).

Similarly, within the fruit group, choices of fresh, canned or dried products should be yellow, orange, or red in color. Appropriate choices include apples, oranges, berries, grapes, kiwi, and pomegranate. For fruits and vegetables, emphasis should be placed on consuming the whole food, rather than

only juice, in order to supply adequate fiber intake (Russell, et al., 1999). Researchers have hypothesized that the beneficial combinations of micronutrients, antioxidants, phytonutrients, and fiber in fruits and vegetables may be responsible for the protective effect against cardiovascular disease (Liu, Manson, Lee, Cole, Hennekens, Willett, et al., 2000).

Diets rich in fruits and vegetables have been found to be effective in lowering blood pressure (Appel, Moore, Obarzanek, Vollmer, Svetkey, Sacks, et al., 1997). Hypertension is a risk factor for congestive heart failure, stroke, and myocardial infarction (Woo, 2000). Among adults 50 years and older, a much higher proportion of those adults have hypertension, and a lower proportion of those adults have optimal blood pressure. Non-pharmacologic approaches such as controlling body weight, reduced sodium intake, reduced alcohol intake, and increased dietary potassium, have been recognized in preventing and treating hypertension. A significant association between diet and blood pressure was found in the Dietary Approaches to Stop Hypertension (DASH) Trial. This trial examined the effect on blood pressure of a diet that was rich in fruits, vegetables, low-fat dairy products, and that restricted the amount of saturated and total fat. The researchers found that people with high blood pressure who followed this diet reduced their systolic blood pressure by about 11 mm/Hg and their diastolic blood pressure by almost 6 mm/Hg (Appel, et al., 1997). By reducing high blood pressure, the risk for developing cardiovascular disease is reduced as well (Woo, 2000).

The National Heart, Lung, and Blood Institute Family Heart Study was a multicenter, population-based study designed to determine whether a high intake

of fruit and vegetable consumption was inversely related with low density lipoprotein concentrations. The sample consisted of both men and women of an average age of 51.5 years for the men and 52.2 years for the women. The participants were asked to respond to a food frequency questionnaire regarding their average consumption of broccoli, cabbage, cauliflower, carrots, corn, spinach, squash, and tomatoes. Results showed an inverse relationship between fruit and vegetable consumption and low-density lipoprotein. In fact, subjects in the highest fruit and vegetable intake groups had low density lipoprotein concentrations that were six to seven percent lower than those in the lowest fruit and vegetable intake group (Djousse, Arnett, Coon, Provine, Moore & Ellison, 2004).

In a cohort study completed by Knekt, Reunanen, Jarvinen, Seppanen, Heliovaara, and Aromaa (1994), the researchers found an inverse association between the intake of fruits and vegetables and the risk of coronary artery disease. Over 5100 Finnish men and women between the ages of 30 and 69, initially free of heart disease, joined the study. An inverse association was observed between dietary vitamin E intake and coronary mortality in both men and women. Similar associations were observed for the dietary intake of vitamin C and carotenoids among women and for the intake of important food sources of these micronutrients, vegetables, and fruits.

Data from two cohort studies, including the Nurses' Health Study and the Health Professionals' Follow-up Study, were collected to better understand the role of specific fruits and vegetables and the relation to ischemic stroke. After controlling for standard cardiovascular risk factors, persons in the highest quintile

of fruit and vegetable intake, over five servings per day, had a relatively low risk of developing a cardiovascular disease compared with those in the lowest quintile. An increased increment of one serving per day of fruit or vegetables was associated with a six percent lower risk of ischemic stroke. Cruciferous vegetables, green leafy vegetables, citrus fruit, and citrus fruit juice contributed most to the apparent protective effect of total fruits and vegetables (Joshipura, Asherio, & Manson, 1999).

According to Tucker, Selhub, Wilson, and Rosenberg (1996), folate, a water-soluble B vitamin, was linked to heart disease prevention in The Framingham Heart Study. The Framingham Study was a population-based longitudinal study of heart disease risk factors. The initial cohort included both men and women age 30-62. Data were collected via food frequency questionnaires and diet records. Blood was drawn from subjects to determine plasma folate concentration. There was a significant inverse relationship between foods high in folate and plasma homocysteine concentrations. Foods making an important contribution to folate status include breakfast cereals, orange juices, green leafy vegetables, and fresh fruit (Tucker, et al., 1996).

Dairy and Cardiovascular Health

Dairy foods, such as whole milk, ice cream, and regular cheese are relatively high in saturated fat and cholesterol. However, dairy products are an important source of nutrients. Within the milk, yogurt, and cheese group, emphasis should be placed on low-fat dairy products. Low-fat dairy products have as many nutrients as regular dairy products with much less saturated fat and cholesterol (National Heart, Lung, and Blood Institute, 2006). A diet including

three servings of low-fat dairy foods accompanied by the consumption of fruits and vegetables is associated with reduced blood pressure in adults with normal to high blood pressure, according to the Dietary Approaches to Stop Hypertension Trial (Appel, et al., 1997).

The National Heart Foundation has recognized the importance of including dairy foods in the dietary management of high cholesterol and high blood pressure by incorporating low-fat or reduced fat milk products. Recently, there has been a great deal of research linking low fat dairy consumption to cardiovascular health (National Heart Foundation, 2006).

According to St-Onge, Farnworth, and Jones (2000), several studies have demonstrated that the consumption of dairy products, especially low-fat dairy products, is associated with lower serum cholesterol concentration. A study by Buonopane, Kilara, Smith, and McCarthy (1992) identified 82 subjects, aged 21-73, and studied the effect of skim milk supplementation on serum cholesterol concentration, blood pressure, and serum triglyceride level. The study was designed as a free-living trial. The participants were requested to maintain their normal lifestyles, including dietary pattern, except for the supplementation of one quart of fortified skim milk to the daily diet in the test group. Supplemental milk treatment was associated with a 6.6 percent reduction of serum cholesterol in the high-cholesterol group within the first four weeks. Reductions in systolic and diastolic blood pressure occurred in the test groups; the low-cholesterol group had a greater reduction in diastolic blood pressure than the high-cholesterol group. Milk supplementation was associated with reduction in serum triglycerides in the high-cholesterol group.

According to Djousse, Pankow, Hunt, Heiss, Province, More, and Ellisiono (2006), data were collected from the 4,797 men and women participants of the National Heart, Lung, and Blood Institute's Family's Heart Study. The data revealed more people who consumed dairy products had a lower systolic blood pressure. The data indicated an inverse association between dairy consumption and hypertension that was dependent mainly among individuals consuming less saturated fat. This suggests that the consumption of low-fat dairy products may help prevent hypertension.

The Iowa's Women's Health Study (1986) was a prospective cohort study of over 34,000 women age 55-69. The participants completed a semiquantitative food frequency questionnaire to measure usual food intake. The women were categorized by quartile of intake of various foods. Multivariate analysis showed those women in the highest quartile of calcium intake were associated with the greatest decreased risk of ischaemic heart disease mortality. However, specific sources of dietary calcium were not mentioned (Bostick, Kushi, Wu, Meyer, Sellers, & Folsom 1999).

Dietary Fats and Cardiovascular Health

Prospective cohort studies and intervention trials have demonstrated that the type of fat is more important to cardiovascular health than the amount of fat. After all, coronary heart disease prevalence remains low in southern Europe, despite high intakes of lipid, mostly as vegetable oils. The positive link between dietary saturated fat and coronary heart disease is strong, as is the evidence that substituting unsaturated fats, such as monounsaturated fatty acids and

polyunsaturated fatty acids, for saturated fats lowers coronary heart disease risk (Nestel, 2002).

Hu, Stampfer, and Manson (1999) examined the relationship between intakes of individual saturated fatty acids and the risk of coronary heart disease. Over 80,000 registered nurses ages 34 to 59 from the Nurse's Health Study participated in this research. A 116-item food-frequency questionnaire was included to assess intake of specific fats and nutrients. At the 14-year follow-up, the association between intakes of poultry and fish and low-fat dairy products, including skim or low-fat milk, yogurt, and cottage cheese and the risk of coronary heart disease was analyzed. After adjusting for age, the consumption of poultry, fish, and low-fat dairy products was associated with a lower risk of developing coronary heart disease.

According to Hu, Stampfer, Manson, Rimm, Colditz, and Rosner (1997), the relationship between fat intake and cardiovascular disease was examined by reviewing the diets of women who participated in the Nurses Health Study. The study findings revealed that for every 5 percent increase of energy intake from saturated fat there was a 17 percent increase in the risk of coronary disease. The researchers observed positive associations between the incidence of coronary heart disease and the intake of saturated fat and trans fat and inverse associations with monounsaturated fat and polyunsaturated fat.

An emphasis has been on increasing the amount of vegetable and fish oil rather than just decreasing the amount of saturated fat and cholesterol. A health advantage of liquid vegetable oils is that they are generally higher in vitamin E and alpha-linoleic acid, an essential omega 3 fatty acid important in the

prevention of cardiovascular disease. In the Nurse's Health Study, a higher consumption of oil-and-vinegar salad dressing, a major source of alpha-linoleic acid, was strongly associated with a lower risk of coronary artery disease. Women who consumed the oil-and-vinegar salad dressing 5 to 6 times a week had roughly 50 percent lower risk of fatal coronary artery disease risk than those who rarely consumed the same type of fat (Hu, Stampfer, & Manson, 1999).

Meat and Fish and Cardiovascular Health

Within the meat, poultry, fish, dry beans, egg and nuts group, emphasis should be placed on variety, with individual choices made according to the needs of the older population. Animal products are one of the main sources of saturated fat and cholesterol. Appropriate choices should include lean cuts of meat. Fish represents a good selection; it provides high-quality protein and omega-3-fatty-acids. Fish, when substituted for meat, help to minimize saturated fat and cholesterol intake (Russell, et al., 1999). Dry peas, beans, and tofu are suitable meat substitutes that are low in saturated fat and cholesterol and high in fiber. These foods can also help to control blood cholesterol levels (National Heart, Lung, and Blood Institute, 2006).

Omega-3-fatty-acids appear to protect the heart by decreasing arrhythmia, triglyceride levels, the growth rate of atherosclerotic plaque, and slightly lowering blood pressure (American Heart Association, 2006). Omega-3 fatty acids are polyunsaturated fats found mostly in seafood. Rich sources of omega-3 fatty acids include fatty, cold-water fish, such as salmon, tuna, mackerel, and herring. Flaxseeds, flax oil, and walnuts also contain omega-3 fatty acids. Most fat in the diet of older people should be in the form of liquid oils or foods prepared with

them. Using a variety of these oils should provide an adequate intake of essential fatty acids (Russell, et al., 1999). There is strong evidence linking the consumption of fish to the prevention of cardiovascular disease. Routine fish eaters experience fewer coronary heart disease events than those who seldom eat fish do. The strongest epidemiological association between any fatty acid and coronary heart disease protection is the long-chain omega-3 fatty acids of fish (Marckmann & Gronbaek, 1999).

Hu, Bronner, Willett, Stampfer, Rexrode, and Albert (2002) examined the relationship between fish and long-chain omega-3 fatty acid consumption and risk of coronary heart disease in women participating in the Nurse's Health Study. A semiquantitative food frequency questionnaire was used to assess food intake. The questionnaire included four fish and seafood items; dark-meat fish such as mackerel, salmon, sardines, bluefish, or sword fish; canned tuna; other fish; and shrimp, lobster, or scallops. During 16 years of follow-up, a significant inverse association between fish and omega-3 fatty acids consumption and incidence of major coronary heart disease events existed.

The Health Professional Follow-up Study was a cohort study comprised of over 51,000 men age 40 to 75 in the year 1986. Among the 51,000 men, 45,722 men were free of cardiovascular disease at baseline, and their usual dietary intake was assessed every four years by a food frequency questionnaire. Over the 14 years of follow-up, both long-chain and medium-chain n-3 polyunsaturated fatty acids, from both seafood and plant sources, were associated with a lower risk of coronary heart disease. Medium-chain omega-3 polyunsaturated fats were particularly associated with coronary heart disease risk when intakes of long-

chain omega-3 polyunsaturated fats were low. In fact, modest dietary intake of medium chain omega-3 polyunsaturated fats was associated with a 40 to 50 percent lower risk of sudden death regardless of omega-6 polyunsaturated fatty acids (Mozaffarian, Ascherio, Hu, Stampfer, Willet, & Siscovick, et al., 2005).

Mozaffarian, Bryson, Lemaitre, Burke, and Siscovick (2005) identified a population-based prospective study of over 4,700 adults age 65 and older who were free of cardiovascular disease at baseline in 1989-1990. The researchers investigated the association between fish consumption and the occurrence of congestive heart failure. The participant's intake was assessed via food frequency questionnaires where consumption of tuna or broiled/baked fish was evaluated. In multivariate-adjusted analysis, tuna or other broiled/baked fish consumption was inversely associated with incident congestive heart failure. Dietary intake of long-chain omega-3 fatty acids was also inversely associated with congestive heart failure, with 37 percent lower risk in the highest quintile of intake.

A Variety of Healthy Foods and Cardiovascular Disease

According to Michels and Wolk (2002), data from over 59,000 women between the ages of 40 and 76 participating in the Mammography Screening Cohort were collected to assess the overall influence of health and disease. Women who consumed healthy foods defined as a high variety of fruits, vegetables, whole grain breads, cereals, fish, and low fat dairy products had a significantly lower cardiovascular related mortality than women who consumed few of these foods. Women who reported regularly consuming 16 to 17 healthy foods per day had 42 percent lower all-cause mortality compared to women reporting consumption of zero to eight healthy foods per day. Cardiovascular

mortality was particularly low among women who reported consuming a high variety of healthy foods.

In a case-controlled study in Greece, data were collected as part of an international cross-cultural study of food habits in later life. One hundred and eighty-two elderly individuals over the age of 70 had their diet assessed with a validated extensive semiquantitative questionnaire on food intake. Those who followed dietary patterns common in the Mediterranean region such as a diet high in fruits, vegetables, legumes, cereals, lean meats, milk and dairy products, and a high monounsaturated: saturated fat ratio, had a lower cardiovascular mortality rates (Trichopoulou, Kouris-Blazos, Wahlqvist, Gnardellis, Lagiou, & Polychronopoulos, et al., 1995).

Review of the available literature indicates that foods associated with whole grains, fruits, vegetables, lean meats, fish, low-fat dairy products, and unsaturated fats are positively connected to the reduced risk of cardiovascular disease. In addition to examining certain foods that are related to prevention of cardiovascular disease, this study explored the differences in food choices between males and females, between races, and between those who do and do not have known cardiovascular disease.

Gender Difference in Food Choices

One aspect of this research examined was the difference in food choices associated with cardiovascular health between men and women. According to Dr. Gutterman from Wisconsin Medical Center, cardiovascular disease develops equally in men and women. However, more men develop heart disease earlier in

life but women are more likely to die from heart disease (Guttermen, 2001). Food choices significantly impact cardiovascular health in both men and women.

According to Bates, Prentice, and Finch (1999), a study to determine gender differences in food choices among those who participated in the National Diet and Nutrition Survey of people aged 65 and older was accomplished by including 80 randomly selected individuals from mainland Britain. The most highly significant gender differences in food choices were that women tend to eat more foods such as apples, pears, yogurt, salads, and raw vegetables, as well as more butter, full-fat milk, pastries, cakes, and biscuits. Men ate more eggs, sugar, sausage, carrots, and drank more alcoholic beverages. In addition, women were more likely to take a dietary supplement. It appeared that women consumed more fruit, vegetables, sweets, as well as took a dietary supplement, whi le men consumed more fat, sugar, and alcohol.

In a more recent study of adults, researchers examined four food choice behaviors in a large sample from 23 countries. Results showed women were more likely to report avoiding high-fat foods, eating more fruits and vegetables, and limiting salt. Researchers suggest gender differences in food choices are partly attributed to women's greater weight control involvement and partly to their stronger beliefs in healthy eating (Warde, Haase, Steptoe, Nillapun, Jonwotiwers, & Bellisle, 2004).

In a longitudinal study which examined the differences in food choices, by use of food frequency questionnaire, among men and women found that women showed an increased consumption of brown and wholemeal bread compared to men. Women drank more milk including whole and skim. Men ate more white

bread and more fat from meat. Women used more fat and salt when cooking compared to men. The study was unable to determine which sex's health declined more in the 6-year follow-up (Fernyhough, Horworth, Campbell, Robertson, & Busby, 1999).

In a population-based study by Shatenstein, Payette, Nadon, & Gray-Donald (2003), 51 healthy, elderly people aged 70 to 86 years were given semiquantitative food frequency questionnaires, which included functional foods defined as health-promoting, to assess usual diet. In this study, such functional foods included but were not limited to whole grain breads, oatmeal, high fiber cereals, apples, oranges, grapes, brussel sprouts, cabbage, tomatoes, cow's milk, soy milk, peanuts, and walnuts. Results showed women had higher consumption of functional foods over their lifetime; however, men had a more difficult time recalling usual foods consumed. The food frequency questionnaire provided data on lifetime functional food consumption that may clarify relationships between diet and health and the role of diet in aging in the future.

In a more recent study, researchers examined food selection among men and women and compared the selections against the participant's sense of coherence. An individual's sense of coherence is reported to correlate with prevalence of some diseases to which dietary habits are linked. In this study, diet intake was recorded by an 84-item semi-quantitative food frequency questionnaire in men and women, aged 25–74 years old from a population in northern Sweden. The questionnaire included questions on various types of fats, milk/dairy products, bread and cereals, fruit, greens and root vegetables, soft drinks and sugar-containing snacks, and spirits, wine and beer. As a result, women ate more

servings of fruit and vegetables per week compared to men. Men ate more servings of breads and cereals per week compared to women. Women consumed fewer grams of fat per week, but consumed more sweets. Both men and women with the highest sense of coherence score consumed more of the healthy food choices (Lindmark, Stegmay, Nilsson, Lindahl, & Johansson, 2005).

According to these research studies, it appears that women tend to eat more fruits and vegetables, whole grain bread, and milk including skim and whole. In addition, women seem to consume more sweets such as pastries and cakes. It appears men consume more meat, saturated fat, white breads, and alcohol compared to women. Women are consuming more fruits and vegetables, which help prevent cardiovascular disease. One the other hand, the fat from whole milk and certain sweets can be detrimental to heart health. Men are consuming more fat, meat, and white bread, these food products tend to lack fiber that helps promote cardiovascular health. This research also shows men consuming more alcohol. However, general research has shown moderate consumption of alcohol, meaning two drinks per day for men and one drink per day for women, lowers the risk of cardiovascular events (Mukamal, Chung, Jenny, Kuller, Longstreth, Mittleman, et al., 2006).

Racial Differences in Food Choices

Food choices can significantly differ according to each individual's background. Another area of interest to this researcher included examining the difference in food choices associated with cardiovascular health among different racial and ethnic groups of people. The review of literature gives insight to possible trends in food choices this research uncovered.

According to James (2004), poor eating habits among African Americans contribute to the cause of obesity and other chronic diseases. Dietary habits among African Americans such as high-fat diets, high-caloric diets, low intake of fruits, vegetables, fiber, grains; high intake of sodium, and high intake of salt-cured meats promote chronic diseases (U.S. Department of Health and Human Services, 2000). According to the United States Department of Agriculture's Health Eating Index, 28 percent of African Americans had a poor diet compared to 16 percent of whites and 14 percent of other racial/ethnic groups (James, 2004). Dietary habits and food choices evolve from the long history of African Americans. Typical foods consumed by this ethnicity include fried, roasted, and boiled dishes of primarily chicken, pork, organ meats, potatoes, corn, and green leafy vegetables (Kittler & Sucher, 2001).

In a study by Hagreaves, Schulundt, & Buchowskims (2002), researchers identified food choices and the factors affecting food choices among African American women. Focus groups were conducted with 40 women, the interactions were audio taped and transcribed for analysis. Common themes with in the meal preference section of the focus group included cooking with whole milk, consuming sweets, "fatty meats," potatoes, convenience foods, fast food, cookies, candy bars, and ice-cream. These types of foods can be linked to the promotion of cardiovascular disease in some way.

Cardiovascular disease is the leading cause of death and disability among Mexican Americans (Sundquist & Winkleby, 1999). In 2001, the prevalence of obesity was estimated at 23.7 percent among Hispanics compares to 19.6 percent for non-Hispanic whites (Mokdad, Ford, Bowman, Dietz, Vinicor, & Bales,

2003). There are several studies on eating patterns and cardiovascular risk among Mexican Americans.

In a research study by Artinan, Myer-Schim, Vander, & Nies (2004), investigators examined the dietary patterns of Mexican American adults living in southwest Detroit. A descriptive design including food consumption patterns in a nonrandom sample of adults. Data were collected by questionnaires that related food categories and serving sizes. The food items consisted of the following; fats/oils, fried foods, desserts/snacks, milk, cheese, breads/tortillas, fruits, vegetables, meats including lean and fatter-cuts, chicken, turkey, fish/shellfish, and eggs. As a result, the participants used more margarine than butter, consumed more whole milk rather than skim or one percent, ate more regular cheese versus reduced fat cheese, consumed two to five servings of bread and tortillas per day, and consumed two to four servings of fruits and vegetables per day. In addition, the participants ate leaner cuts of meat, consumed eggs four times a week, and chose cakes, pastries, and ice cream for dessert. When assessing cardiovascular risk factors, more participants reported being unaware of risk factors rather then having risk factors. The dietary patterns found in this study contribute to cardiovascular risk by contributing to overweight and obesity.

Other researchers have used Hispanic Health and Nutrition Examination Survey conducted by the National Center for Health Statistics. Overall, they found the percentage of Hispanics using whole milk was greater then the percentage using skim milk and that cheese was eaten more often then yogurt or pudding. Fewer than 10 percent of Hispanics interviewed reported eating citrus fruits, yellow/orange fruits, or orange and green vegetables more than once a day.

It appeared that Mexican American preferred to eat tortillas, rice, and pasta more than once a day compared to other foods (Kuczmarski, Kuczmarski, & Najjar, 1995).

According to research conducted by Pareo-Tubbeh, Romero, Baumgartner, Garry, Lindeman, & Koehler (1999), investigators identified specific foods contributing to energy and nutrients requirements among Hispanic and non-Hispanic white men and women. The sample consisted of 330 Hispanic adults and 405 Non-Hispanic white adults between the ages of 65-96. A food frequency questionnaire was used to collect data. The results showed the top ranked foods consumed by ethnicity. According to the food frequency questionnaire, the most frequent foods consumed in order by the Hispanic participants included coffee, sugar, 2% milk, tortillas, margarine, orange/grape juice, green chile sauce, salad oil, dark bread, whole milk, white bread, beans, and tomatoes. The top foods consumed in order by the non-Hispanic white participants included coffee, margarine, dark bread, 2% milk, skim milk, tea, green salad, white bread, sugar, tomatoes, and bananas. According to the rest of the data, there was a higher ranking of southwestern regional foods among Hispanics.

One research study examined food consumption patterns of African Americans, Native Americans, and white adults in North Carolina. Participants were recruited from the Rural Health and Nutrition Study. Food frequency questionnaires and semi-structured interviews were used to collect data on the common dietary patterns of these groups. African American participants consumed more orange juice, ate more meat, cooked cereal, collards, eggs, table

fats, and bacon compared to Native Americans and white participants. Native American participants ate more apples, bananas, cantaloupe, corn, green beans, cornbread, and sweets compared to African American and white participants. The white participants ate more tomatoes, cauliflower, potatoes, mayonnaise, and salad dressing compared to African American and Native American participants (Bell, Vitolins, Arcury, & Quandt, 2003).

It appears these research studies show dietary patterns associated with cultural background. African Americans tend to eat more meat, whole milk, green-leafy vegetables, eggs, bacon, and corn. Hispanic Americans appear to eat more breads, tortillas, regular cheese, leaner meats, and sweets. Native Americans tend to eat more bananas, cantaloupe, green beans, and sweets. Caucasians tend to eat more margarine, dark bread, 2% and skim milk, salads, mayonnaise, and tomatoes. Even though these dietary patterns reflect heritage and background, a generalized assumption regarding food choices cannot be made.

Cardiovascular Health and Food Choices

The last area of interest to this researcher was the difference in food choices among those who have known cardiovascular disease and those who do not have known cardiovascular disease. According to several studies mentioned in this review of literature, food choices play an important role in cardiovascular health.

In a case controlled study by Loke & Chan (2005), researches were interested in identifying the dietary-related risk factors for coronary atherosclerosis among Hong Kong Chinese people. A total of 145 consecutive patients scheduled to have coronary angiogram in a regional hospital in Hong

Kong completed a self-reported questionnaire on their dietary intake for 1 week. Results revealed patients confirmed as having coronary atherosclerosis were more likely than those with normal coronary vessels to consume more meat, fat, eggs, and sweets as well as rank deep fry, stir fry, and pan fry as their preferred cooking methods over steaming or boiling. The researchers concluded that efforts should be directed particularly to promoting nutrition and healthy cooking methods as protective actions against coronary atherosclerosis.

In one study that examined the dietary habits of patients with dyslipidemia, cardiovascular disease, or hypertension, researchers were able to identify if these patients were following a therapeutic diet by assessing a food frequency questionnaire, as well as collecting a fasting blood specimen to measure total serum cholesterol and triglycerides. Results showed those with dyslipidemia were attempting to decrease dietary fat but the differences were statistically significant only for saturated fat and still exceed standard recommendations. Males with hypertension consumed significantly more energy from saturated fat. The researchers noted that even though an apparent lack of adherence to appropriate dietary practices such as low fat, high fruit and vegetable intake can improve disease status, participants in this study reported high motivation to alter their diets (Neuhouser, Miller, Kristal, Barnett, & Cheskin, 2002).

According to a cross-sectional survey that enrolled over 2,000 participants investigated the association between fish consumption and various levels of inflammatory markers in healthy adults. Results showed those who consumed more than 300 grams of fish per week had an average of 33 percent lower C -

reactive protein compared to those who did not consume fish. Significant results were also observed when lower quantities of 150 to 300 grams per week of fish were consumed. Researchers concluded that fish consumption was independently associated with lower inflammatory marker levels, among healthy adults (Zampelas, Panagiotakos, Pitsavos, Das, Chrysohoou, Skoumas, et al., 2005).

In research by Kerver, Yang, Bianchi, & Song (2003) investigators were interested in identifying dietary patterns and the relationship to cardiovascular health. With the use of food-frequency questionnaire data from the third National Health and Nutrition Examination Survey, dietary patterns of healthy adults were identified by factor analysis. Results showed six dietary patterns identified, two patterns emerged as the most predominant. The Western pattern was characterized by high intakes of processed meats, eggs, red meats, and high-fat dairy products, and the American-healthy pattern was characterized by high intakes of green leafy vegetables, salad dressings, tomatoes, peppers, green beans, corn, and peas, and tea. As a result, the Western pattern was positively associated with cardiovascular risk factors. The American-healthy pattern had no relation with the cardiovascular risk factors.

These studies alone demonstrate how dietary patterns or food choices differ among those who do and do not have cardiovascular disease. It appears healthy adults free of known cardiovascular disease choose foods low in saturated fat, high in vitamins and minerals, and rich in omega-3 fatty acids. According to the literature, those with known cardiovascular disease consume high amounts of meat, fat, eggs, and sweets, as well as choose to prepare their meal by frying.

Research indicates a diet rich in whole grains, fruits, vegetables, lean meats, and low in fat can positively impact cardiovascular health among older adults. Food choices appear to differ between males and females, between races, and between individuals with and without cardiovascular disease. The follow section will focus on the methodology of Older Adults' Food Choices Associated with Cardiovascular Health research study. The design of study, sample, instrument, pilot study, data collection, and data analysis are explored in further detail.

Chapter 3

Methodology

The purpose of this study was to identify food choices older adults associate with cardiovascular health. The methodology used in this research study included a quantitative questionnaire and focus group sessions to collect data on the foods older adults associate with cardiovascular health. A sample was obtained through a senior nutrition program. The data were collected and analyzed for the purpose of answering the research questions.

Design of Study

The design of this study was descriptive in nature because it provided information about the sample being studied by using questionnaires and focus groups without establishing a causal relationship. The questionnaire posed a series of questions pertaining to several food choices associated with cardiovascular health. The focus group was designed for the researcher to ask a standard set of questions regarding which types of foods are the healthiest for the heart, with more individually tailored questions depending on the participants' responses.

The quantitative questionnaire provided the researcher with numerical data regarding heart healthy food choices, and the focus groups provided the researcher with verbal data regarding heart healthy food choices. The quantitative method and focus groups provided the researcher with two forms of data to identify common responses.

Sample

The purpose of this study was to identify food choices older adults associate with cardiovascular health. The research questions focused on sex, race, and cardiovascular health status. Therefore, a sample of older adults, male and female, any race, and any cardiovascular health status were acceptable for the study.

Description of the sample. The convenience sample was obtained through the community's senior nutrition program. All sample participants were required to meet the following criteria. First, the participants were 55 years of age and older. Second, the participants were willing and able to participate. Finally, the participants were of any race, sex, or cardiovascular health status.

Selection of sample. Participants of this study consisted of volunteers on the days of site visits. Fifty-two participants were recruited to participate. The researcher was at the congregate meal site during the lunch hour to invite seniors to participate in this study. The researcher traveled to different sites within the senior nutrition program in order to obtain the desired number of participants.

Instrument

Prior to administering the questionnaires and conducting focus groups, the researcher obtained approval from Institutional Review Board to collect data. Upon approval, a questionnaire and focus group session were used to collect data (see Appendix A). Prior to administering the questionnaire the participants were asked their sex, race, age range, educational level, and cardiovascular health for

the purpose of describing the sample. In addition, sex, race, and cardiovascular health were asked for the purpose of answering three of the research questions.

The questionnaire was comprised of seven multiple-choice questions regarding specific foods associated with the cardiovascular health. Each question had a set of ten different answers. Within the set of answers there were both accurate and inaccurate choices. The researcher used a structured guide during focus group sessions to obtain data on foods the participants associate with the prevention of cardiovascular disease (see Appendix B).

The researcher developed both the multiple-choice questions and focus group questions. The questionnaire was modified to meet the needs of the elderly population. The modifications included increased font size and limiting the number of questions. In addition, the researcher offered to read the questions and selection of answers, as well as mark the answers for the participants who had difficulty in those areas.

Content validity of the study was achieved when three professionals in the field of research methods and/or dietetics reviewed the questionnaire prior to the researcher administering the questionnaire to the participants. The research study was pilot tested and corrections to the questionnaire were made; however, further testing of the questionnaire needs to be completed in order to achieve reliability.

Pilot Test

A pilot test was conducted at a senior nutrition program center in west central Illinois with 12 participants. The researcher obtained verbal consent from the senior nutrition program personnel, as well as the participants prior to conducting the pilot study. The original questionnaire was administered to the

participants during the lunch hour. The researcher explained that completing the questionnaire was voluntary.

Upon administering the questionnaire, issues were identified. First, some participants were unable to understand the meaning of the words Caucasian, cardiovascular, and ethnicity. Second, some of the participants required assistance in reading the questionnaire.

When the questionnaire portion was complete, the researcher asked for the participants to stay afterward for a focus group session. Five out of the 12 participants volunteered for the focus group session. The researcher explained that the verbal responses to the questions would be audio taped for research purposes only. Upon conducting the focus group two main issues were identified. First, not all who volunteered for the focus group participated in the discussion and second, some of the responses were directed towards food they would not eat rather than answering the question of which foods are heart healthy.

After the pilot study was complete, the researcher was able to identify the areas of improvement for the questionnaire and focus group. Changes to the questionnaire included replacing terminology to suit the older population in understanding the questions, giving an age range for participants rather than having the participants give their age, and listing cardiovascular diseases and events the older adults could identify. Added changes included expanding the level of education section to give a broader idea of the educational background of the participants, and addressing that all participants' information would remain confidential. The researcher indicated that the results from this questionnaire would be used for a thesis research study and there were no foreseeable risks or

direct benefits to completing the survey. If the participants agreed to participate in this study, they were asked to circle their answers to the best of their ability.

Changes were made to the selection of answers to give more realistic choices of foods associated with each food group. The researcher attempted to engage all participants during the focus group sessions and directed questions to each individual within the group. The researcher attempted to keep the participants on track by redirecting the questions when participants got off subject.

Procedure for Data Collection

Data collection involved a self-completed questionnaire from 52 participants during the senior nutrition program site visits. The researcher asked groups of people to participate in the study during the lunchtime hour on the days of site visits. The researcher invited the volunteers to participate in the focus group session after completion of the multiple-choice portion of the study. The focus group sessions were accomplished during three sessions of five to six participants per group. The session was held in the same location that the participants completed the questionnaires. The focus groups were conducted at tables located in the dining area of the facility. The researcher directed the focus groups and had a recorder available to collect the participants' responses. The researcher explained the purpose of the focus group to the participants and explained that their comments were audio taped for research purposes only and all information from the audiotape was kept confidential. Recording began at that time and the researcher asked the participants which foods from each food group

they thought were the healthiest for the heart. Based upon the responses, the researcher asked more individualized questions in order to obtain specific foods.

Data Analysis

The focus of this study was to determine whether older adults know which foods are associated with cardiovascular health. This was accomplished by analyzing data from the multiple-choice questionnaire and focus group sessions and compiling the results. The responses from the multiple-choice portion were entered into a Microsoft Excel spreadsheet where frequency and percentages regarding the frequently selected heart healthy foods were determined. In addition, the researcher ranked the most frequently selected food choices for each food group according to sex, race, and those who have and do not have known cardiovascular disease. Chi-square tests were used to determine if there were statistically significant differences in the food choices between males and females, between races, and between those with and without known cardiovascular disease. The responses from the focus group sessions were transcribed and grouped into responses by the researcher and a Registered Dietitian to assure the information would be accurately reported in the data analysis process.

The following section explores the results and discussion of the research study regarding the food choices older adults' associate with cardiovascular health. Demographic data and the data from the questionnaire and focus groups were obtained and reported.

Chapter 4

Results and Discussion

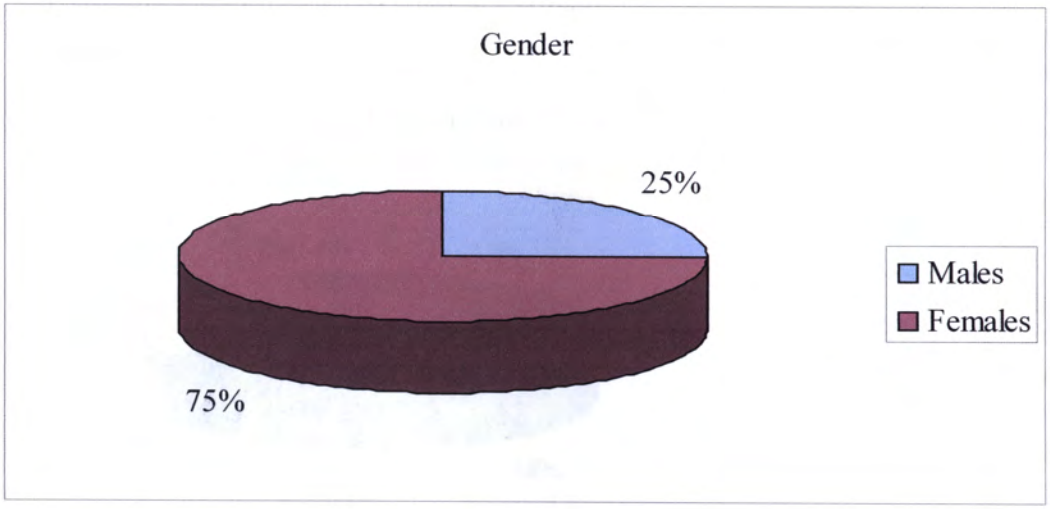
The purpose of this study was to determine whether older adults know which foods are associated with cardiovascular health. Research question number one asked how accurate older adults are at identifying foods that promote cardiovascular health. Research question number two asked if males or females were more likely to identify foods that promote cardiovascular health. Research question number three asked which race was more likely to identify foods that promote cardiovascular health. Research question number four asked how accurate those with known cardiovascular disease and those without known cardiovascular disease are at identifying foods that promote cardiovascular health.

Descriptive statistics were used to analyze responses to the Older Adults' Food Choices Associated with Cardiovascular Disease questionnaire. Fifty-two participants from a senior nutrition program provided responses to the multiple choice portion, and sixteen participants provided responses to the focus group session. Responses to the focus group were examined and reported.

Demographic Data

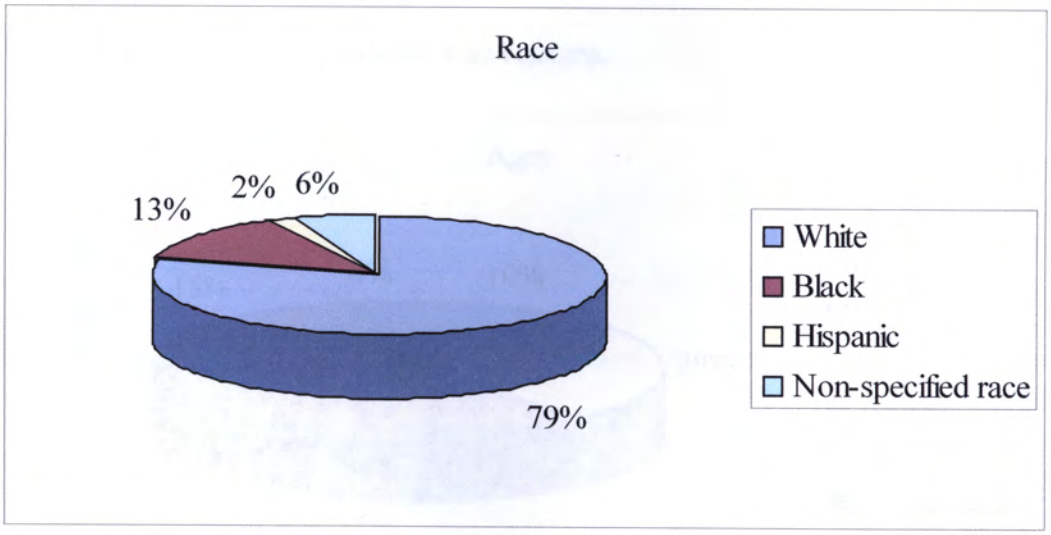
Participants were volunteers from a senior nutrition program located in east central Illinois. Thirty-nine participants were female and 13 were male (Figure 1).

Figure 1. Percentages of male and female participants.



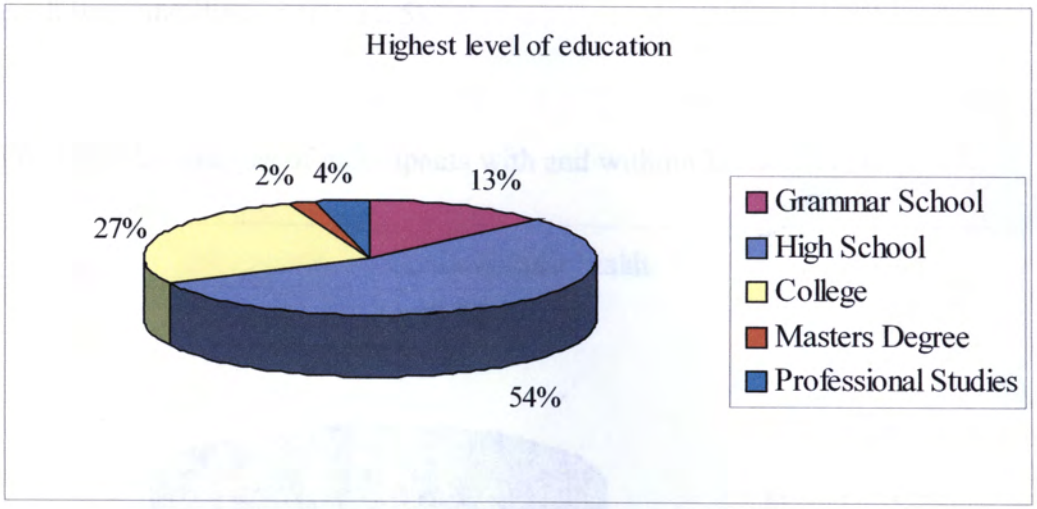
Forty-one participants were white, 7 were black, 1 was Hispanic, and 3 were other non-specified race (Figure 2).

Figure 2. Percentages of racial make-up of participants.



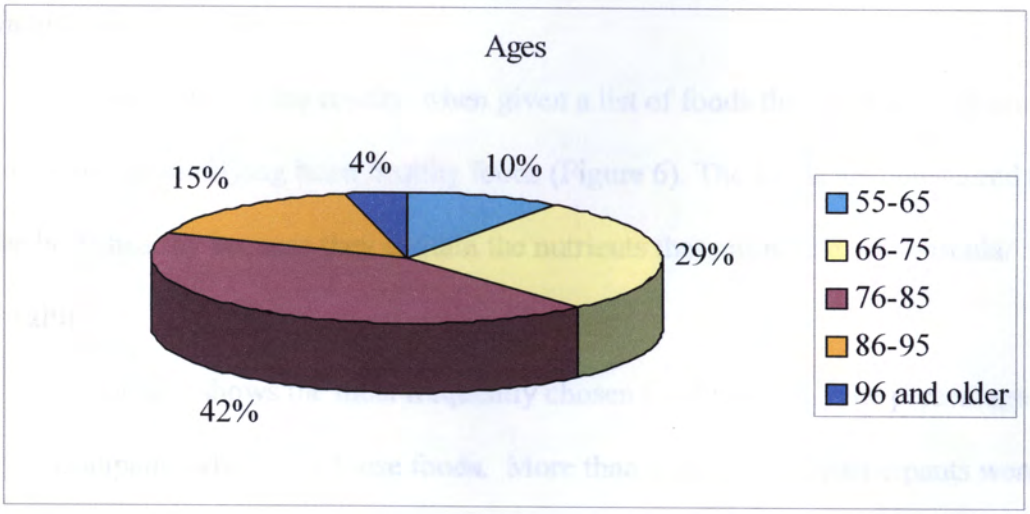
The participants' highest level of education varied as well. Seven participants completed grammar school, 28 completed high school, 14 completed college, one had a Masters degree, and two had completed professional studies (Figure 3).

Figure 3. Percentages of the highest level of education received among participants.



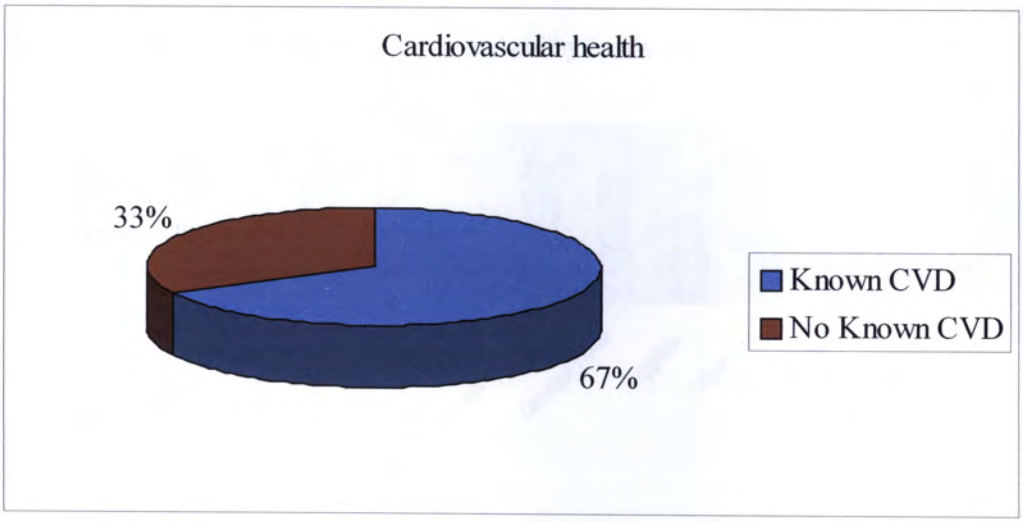
Five of the participants ranged from 55-65 years of age, 15 ranged from 66-75 years of age, 22 ranged from 76-85 years of age, 8 ranged from 86-95 years of age, and 2 of the participants were age 96 and older (Figure 4).

Figure 4. Percentages of participant age ranges.



As for cardiovascular health, 35 participants reported having known cardiovascular disease and 17 participants reported having no known cardiovascular disease (Figure 5).

Figure 5. Percentages of participants with and without known CVD.



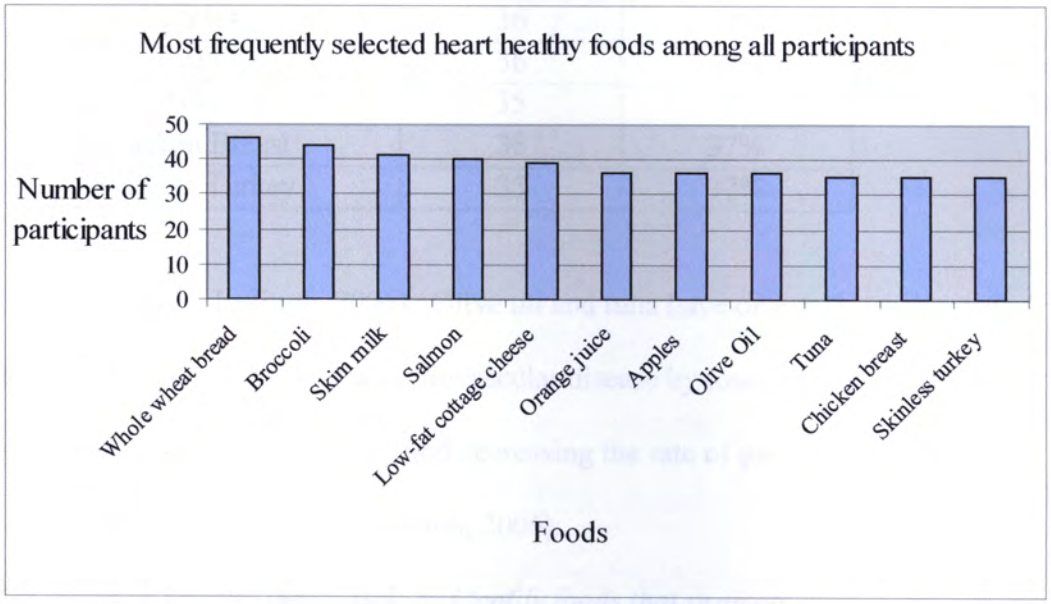
How accurate older adults are at identifying foods that promote cardiovascular health?

According to the results, when given a list of foods the older adults were accurate in identifying heart healthy foods (Figure 6). The foods are considered to be heart healthy because they contain the nutrients that promote cardiovascular health.

Table 1 shows the most frequently chosen food items and the percentage of participants who chose those foods. More than a third of the participants were able to identify skinless turkey, chicken breast, and tuna as heart healthy. More than half of the participants were able to identify olive oil, apples, and orange juice as heart healthy, and more than three-quarters of the participants were able

to identify low-fat cottage cheese, salmon, skim milk, broccoli, and whole wheat bread as heart healthy.

Figure 6. Results of the most frequently selected heart healthy foods among all participants.



All of the foods shown in Table 1 are associated with heart health. Whole wheat bread contains fiber, folic acid, and vitamins known to be associated with lowered blood pressure and cholesterol (Tucker, et al., 1996). Broccoli, orange juice, and apples contain folic acid, potassium, and vitamins C and B that support heart health by contributing to lower cholesterol, blood pressure, homocysteine levels, and protect against low density-lipoprotein oxidation (Lampe, 1999). Skim milk, low-fat cottage cheese, chicken breast, and skinless turkey are low in saturated fat, which is associated with lower cholesterol levels (National Heart,

Table 1. Most commonly chosen food items among all participants.

Food Items	Frequency	Percentage
Whole Wheat Bread	46	88%
Broccoli	44	85%
Skim Milk	41	79%
Salmon	40	77%
Low-fat cottage cheese	39	75%
Orange Juice	36	69%
Apples	36	69%
Olive Oil	36	69%
Tuna	35	37%
Chicken Breast	35	37%
Skinless Turkey	35	37%

Lung, and Blood Institute, 2006). Olive oil and tuna have omega-3 unsaturated fats which lessen the risk of a cardiovascular disease by lowering blood pressure, triglycerides, heart arrhythmias, and decreasing the rate of plaque growth in the arteries (American Heart Association, 2006).

Are males or females more likely to identify foods that promote cardiovascular health?

To determine if the differences in food choices between the female and male participants were statistically significant, a non-parametric statistical analysis test (chi-square test) using GraphPad Software was used. Table 2 shows the P values for each food group were >0.05; therefore, the differences between the food choices were not statistically significant.

Even though there was not a statistically significant difference between the food choices of the male and female participants, both sexes were able to accurately identify heart healthy foods. Figure 7 represents the most frequently identified heart healthy foods and the percentages of male and female participants

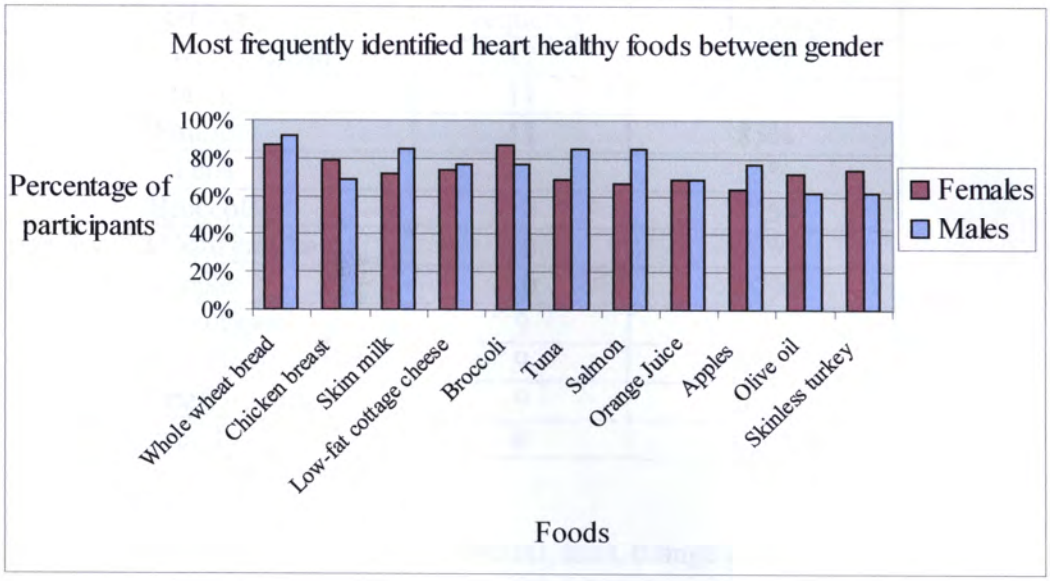
Table 2. Chi-Square Analysis of Food Choices among Female (n=39) and Male (n=13) Participants.

Food Groups	χ^2	*df*	*p*
Fats	13.71	9	0.1330
Seafood	14.15	9	0.1711
Meat	6.94	9	0.6434
Fruits	5.96	9	0.7439
Dairy	3.47	9	0.9427
Grains	2.74	9	0.9737
Vegetables	2.33	9	0.9851

that identified those foods. A greater percentage of males compared to females identified whole wheat bread, skim milk, low-fat cottage cheese, tuna, salmon, and apples as heart healthy. A greater percentage of females compared to males identified chicken breast, broccoli, olive oil, and skinless turkey as heart healthy. An equal percentage of males and females identified orange juice as heart healthy.

Table 3 shows the most frequently selected heart healthy foods among males, which were whole wheat bread, skim milk, salmon, tuna, broccoli, low-fat cottage cheese, apples, chicken breast, lean beef, orange juice, and grape juice. Male participants successfully identified heart healthy foods. Whole wheat bread, broccoli, apples, are good sources of fiber, folate, antioxidants which promote heart health by association with lowered cholesterol and blood pressure according

Figure 7. Healthy food choices between males and females.



to Hu (2003) and Tucker et al. (1996). Grape juice and orange juice are good sources of antioxidant phytochemicals which help prevent cells from damage (Liu et al. 2000). Low-fat cottage cheese, chicken breast, salmon, tuna, and lean beef are low in saturated fat, which is associated with lowered cholesterol levels (National Heart, Lung, and Blood Institute, 2006). Salmon and tuna are good sources of omega-3 unsaturated fat, which promotes healthy blood pressure, and is associated with increased high density lipoprotein levels, and is associated with lower triglyceride levels, according to the American Heart Association (2006). Males included apples, lean beef, and grape juice in their most frequently selected heart healthy food items as females did not have these foods in their most frequently selected heart healthy food items (Tables 3 and 4).

Table 4 shows the most frequently selected heart healthy foods among females, which were whole wheat bread, broccoli, chicken breast, low-fat cottage

Table 3. Most frequently chosen food items among male participants.

Food Items	Frequency	Percentage
Whole Wheat Bread	12	92%
Skim milk	11	85%
Salmon	11	85%
Tuna	11	85%
Broccoli	10	77%
Low-Fat Cottage Cheese	10	77%
Apples	10	77%
Chicken Breast	9	69%
Lean Beef	9	69%
Orange Juice	9	69%
Grape Juice	8	62%

cheese, skinless turkey, skim milk, olive oil, tuna, orange juice, salmon, and bananas. Female participants successfully identified heart healthy foods. In fact, female and male participants chose several of the same most frequently identified heart healthy foods, such as whole wheat bread, broccoli, chicken breast, low-fat cottage cheese, skim milk, salmon, and tuna; all of which promote cardiovascular health. However, olive oil and bananas are among the females' most frequently selected heart healthy food items. Olive oil is a source of vitamin E and alpha-linoleic acid known to be associated with lowering cholesterol and preventing oxidation of cells (Hu et al. 1999). Bananas are a good source of potassium, a mineral essential for heart health as it plays a role in controlling blood pressure (Woo, 2000).

The ideal heart healthy answers for question six on the questionnaire included whole wheat bread, brown rice, plain oatmeal, and whole grain pasta. Whole wheat bread was the most frequently chosen heart healthy food item overall, as well as the most frequently chosen heart healthy food from the bread group among both males and females (Tables 5 & 6).

Table 4. Most frequently chosen food items among female participants.

Food Items	Frequency	Percentage
Whole Wheat Bread	34	87%
Broccoli	34	87%
Chicken Breast	31	79%
Low-Fat Cottage Cheese	29	74%
Skinless Turkey	29	74%
Skim Milk	28	72%
Olive Oil	28	72%
Tuna	27	69%
Orange Juice	27	69%
Salmon	26	67%
Banana	26	67%

Ninety-two percent (n=12/13) of males and 87 percent (n=34/39) of females identified whole wheat bread as heart healthy (Tables 3 & 4). Sixty-two percent (n=8/13) of males and females (n=24/39) selected oatmeal as heart healthy. Forty-six percent of males (n=6/13) and females (n=18/39) chose brown rice. Thirty-eight percent (n=5/13) of males and 36 percent (n=14/39) of females selected whole grain pasta.

The less heart-healthy grains included white bread, crackers, rice, doughnuts, egg noodles, and muffin. Zero percent (n=0/13) of males chose white bread, doughnuts, or a regular muffin. Three percent of females (n=1/39) chose white bread, doughnuts, and egg noodles. Eight percent (n=1/13) of males selected crackers, white rice, and egg noodles. Five percent (n=2/39) of females chose crackers as 10 percent (n=4/39) of females chose white rice.

The ideal heart healthy answers for question seven on the questionnaire included strawberries, banana, grape juice, orange juice, canned peaches in juice, blueberries, and apples. Apples were the most frequently selected heart healthy food from the fruit group among males as, 77 percent (n=10/13) of males selected

Table 5. Frequency and percentages of food choices among male participants.

Grains	Frequency	Percentage	Meat	Frequency	Percentage
Whole Wheat Bread	12	92%	Chicken Breast	9	69%
Oatmeal	8	62%	Lean Beef	9	69%
Brown Rice	6	46%	Skinless turkey	8	62%
Whole Grain Pasta	5	38%	Liver	5	38%
Egg Noodles	1	8%	Pork tenderloin	3	23%
Crackers	1	8%	Bologna	2	15%
White rice	1	8%	Hot dogs	1	8%
Regular Muffin	0	0%	Fried chicken	1	8%
Doughnuts	0	0%	Bacon	0	0%
White bread	0	0%	Sausage	0	0%
Fruits	Frequency	Percentage	Fats	Frequency	Percentage
Apples	10	77%	Olive Oil	8	62%
Grape juice	8	62%	Almonds	7	54%
Orange Juice	8	62%	Canola Oil	7	54%
Blueberries	6	46%	Peanut Butter	6	46%
Banana	5	38%	Corn Oil	2	15%
Strawberries	4	31%	Coconut oil	2	15%
Peaches, juice	3	23%	Margarine	2	15%
Coconut	2	15%	Butter	0	0%
Pears, syrup	1	8%	Lard	0	0%
Oranges, syrup	0	0%	Shortening	0	0%
Vegetables	Frequency	Percentage	Seafood	Frequency	Percentage
Broccoli	10	77%	Tuna	11	85%
Tomato	7	54%	Salmon	11	85%
Spinach	7	54%	Trout	7	54%
Iceberg lettuce	7	54%	Cod	6	46%
Beets	6	46%	Mackerel	4	31%
Garlic	5	38%	Lobster	3	23%
Canned corn	2	15%	Breaded/Fried shrimp	0	0%
Canned peas	2	15%	Fried catfish	0	0%
Dill pickle	1	8%	Breaded/Fried calamari	0	0%
Sauerkraut	1	8%	Fried crab cakes	0	0%
Dairy	Frequency	Percentage			
Skim Milk	12	92%			
Low-fat cottage cheese	10	77%			
Low-fat cheese	7	54%			
Low-fat yogurt	7	54%			
Low-fat sour cream	6	46%			
Regular yogurt	3	23%			
Regular cottage cheese	2	15%			
Ice cream	1	8%			
Whole milk	0	0%			
Regular sour cream	0	0%			

Table 6. Frequency and percentage of food choices among female participants.

Grains	Frequency	Percentage	Meat	Frequency	Percentage
Whole Wheat Bread	34	87%	Chicken Breast	31	79%
Oatmeal	24	62%	Skinless turkey	29	74%
Brown Rice	18	46%	Lean Beef	22	56%
Whole Grain Pasta	14	36%	Liver	12	31%
White rice	4	10%	Pork tenderloin	9	23%
Regular Muffin	3	8%	Bologna	3	8%
Crackers	2	5%	Bacon	2	5%
Doughnuts	1	3%	Hot dogs	1	3%
Egg Noodles	1	3%	Sausage	1	3%
White bread	1	3%	Fried chicken	0	0%
Fruits	Frequency	Percentage	Fats	Frequency	Percentage
Orange Juice	27	69%	Olive Oil	28	72%
Banana	26	67%	Canola Oil	23	59%
Apples	25	64%	Peanut Butter	14	36%
Strawberries	19	49%	Almonds	12	31%
Blueberries	18	46%	Margarine	7	18%
Grape juice	12	31%	Corn Oil	6	15%
Peaches, juice	5	13%	Butter	3	8%
Coconut	3	8%	Coconut oil	0	0%
Pears, syrup	3	8%	Lard	0	0%
Oranges, syrup	0	0%	Shortening	0	0%
Vegetables	Frequency	Percentage	Seafood	Frequency	Percentage
Broccoli	34	87%	Tuna	27	69%
Spinach	25	64%	Salmon	26	67%
Tomato	19	49%	Cod	13	33%
Garlic	18	46%	Mackerel	6	15%
Beets	16	41%	Breaded/Fried shrimp	6	15%
Iceberg lettuce	16	41%	Lobster	4	10%
Canned Peas	8	21%	Fried crab cakes	3	8%
Canned corn	4	10%	Fried catfish	2	5%
Dill pickle	2	5%	Breaded/Fried calamari	2	5%
Sauerkraut	1	3%	Trout	2	5%
Dairy	Frequency	Percentage			
Low-fat cottage cheese	29	74%			
Skim Milk	28	72%			
Low-fat yogurt	21	54%			
Low-fat cheese	21	54%			
Low-fat sour cream	12	31%			
Regular Yogurt	11	28%			
Whole Milk	4	10%			
Regular cottage cheese	4	10%			
Ice cream	1	3%			
Regular sour cream	1	3%			

apples compared to 64 percent (n=25/39) of females (Tables 5 & 6). Orange juice was the most frequently selected heart healthy fruit among females, as 69 percent (n=27/39) of females selected orange juice. Sixty-seven percent (n=26/39) of females and 38 percent (n=5/13) of males chose bananas as heart healthy. Both males and females selected other heart healthy fruits, such as strawberries, grape juice, blueberries, and canned peaches in juice less often. Thirty-one percent (n=4/13) of males and 49 percent (n=19/39) of females selected strawberries. Sixty-two percent of males (n=8/13) and 31 percent (n=12/39) of females chose grape juice. Forty-six percent of males (n=6/13) and females (n=18/39) chose blueberries.

The less healthy fruits listed in the questionnaire were coconut, oranges in syrup, and pears in syrup. Fifteen percent (n=2/13) of males and 8 percent (n=3/39) of females selected coconut. Eight percent of males (n=1/13) and females (n=3/39) chose pears in syrup and zero percent of male (n=0/13) and female (n=0/39) participants chose oranges in syrup.

The ideal heart healthy answers for question eight on the questionnaire included tomato, spinach, broccoli, garlic, and beets. Broccoli was the most frequently selected heart healthy food from the vegetable group among both males and females. Seventy-seven percent (n=10/13) of males and 87 percent (n=34/39) of females selected broccoli (Tables 5 & 6). Spinach was selected more frequently among females compared to males, as 64 percent (n=25/39) of females and 54 percent (n=7/13) of males chose spinach. Tomatoes were selected more frequently among males compared to females, as 54 percent (n=7/13) of males and 49 percent (n=19/39) of females chose tomatoes. The other heart

healthy vegetables, such as garlic and beets, were selected less frequently among both males and females. Thirty-eight percent (n=5/13) of males and 46 percent (n=18/39) of females selected garlic. Forty-six percent (n=6/13) of males and 41 percent (n=16/39) of females selected beets.

Iceberg lettuce, canned corn, dill pickle, sauerkraut, and canned peas were less healthy food choices for the vegetable group. Fifty-four percent of males (n=7/13) and 41 percent (n=16/39) of females chose iceberg lettuce. Fifteen percent (n=2/13) of males selected canned corn and canned peas. Ten percent (n=4/39) of females chose canned corn, as 21 percent (n=8/39) chose canned peas. Eight percent (n=1/13) of males selected dill pickle and sauerkraut. Five percent (n=2/39) of females selected dill pickle, as 3 percent (n=1/39) of females selected sauerkraut.

The ideal heart healthy answers for question nine on the questionnaire included skim milk, low-fat cottage cheese, low-fat yogurt, low-fat cheese, and low-fat sour cream. Skim milk was the most frequently selected heart healthy food from the dairy group among both males, as 92 percent (n=12/13) of males and 72 percent (n=28/39) of females identified skim milk as heart healthy (Tables 5 & 6). Low-fat cottage cheese was the most frequently identified heart healthy dairy item among females, as 74 percent (n=29/39) of females and 77 percent (n=10/13) of males chose low-fat cottage. The heart healthy dairy products, low-fat yogurt and low-fat cheese, were selected less often compared to the heart healthy dairy products mentioned above. Fifty-four percent of males (n=7/13) and females (n=21/39) chose low-fat yogurt and low-fat cheese. Forty-six percent (n=6/13) of males and 31 percent (n=12/39) of females chose low-fat sour cream.

Regular yogurt, ice cream, whole milk, regular sour cream, and regular cottage cheese were the less healthy food choices for the dairy group. Twenty-three percent (n=3/13) of males and 28 percent (n=11/39) of females selected regular yogurt. Eight percent (n=1/13) of males chose ice cream. Three percent (n=1/39) of females chose ice cream and regular sour cream. Zero percent (n=0/13) of males chose whole milk and regular sour cream. Ten percent of females (n=4/39) selected whole milk. Fifteen percent (n=2/13) of males and ten percent (n=4/39) of females selected regular cottage cheese.

The ideal heart healthy answers for question ten on the questionnaire included chicken breast, lean beef, skinless turkey, and pork tenderloin. Seventy-nine percent (n=31/39) of females and 69 percent (n=9/13) of males were able to identify chicken breast as heart healthy (Tables 5 & 6). Lean beef was selected more frequently by males compared to females, as 69 percent (n=9/13) of males and 56 percent (n=22/39) selected lean beef as a heart healthy food item. A greater percentage of females (74%) compared to males (62%) identified skinless turkey as heart healthy. Twenty-three percent of males (n=3/13) and females (n=9/39) selected pork tenderloin as heart healthy.

The less heart healthy food items in the meat group were bacon, sausage, liver, hot dogs, and bologna. Zero percent (n=0/13) of male participants chose bacon or sausage. Five percent (n=2/39) of females selected bacon, as 3 percent (n=1/39) selected sausage. Thirty-eight percent (n=5/13) of males and 31 percent (n=12/39) of females selected liver. Eight percent (n=1/13) of males chose fried chicken and hot dogs. Zero percent (n=0/39) of females selected fried chicken, 8 percent (n=3/39) selected bologna, and 3 percent (n=1/39) selected hot dogs.

The ideal heart healthy answers for question 11 on the questionnaire included olive oil, canola oil, almonds, corn oil, and peanut butter. Olive oil was the most frequently selected fat among males and females, as 72 percent (n=28/39) of females were able to identify olive oil as heart healthy, 62 percent (n=8/13) of males identified olive oil as a heart healthy item (Tables 5 & 6). Fifty-four percent (n=7/13) of males and 31 percent (n=12/39) of females identified almonds as heart healthy. Fifty-nine percent (n=23/39) of females and 54 percent (n=7/13) of males chose canola oil as a heart healthy item. Fats such as corn oil and peanut butter were selected less often among males and females. Fifteen percent of males (n=2/13) and females (n=6/39) chose corn oil. Forty-six percent (n=6/13) of males and 36 percent (n=14/39) of females selected peanut butter.

The less heart healthy fats included coconut oil, butter, margarine, lard, and shortening. Fifteen percent (n=2/13) of males and 0 percent (n=0/39) of females chose coconut oil. Zero percent (n=0/13) of males and 8 percent (n=3/39) of females selected butter. Fifteen percent of males (n=2/13) and 18 percent (n=7/39) of females selected margarine. Zero percent of males (n=0/13) and females (n=0/39) selected lard or shortening.

The ideal heart healthy answers to question 12 on the questionnaire included tuna, salmon, mackerel, cod, and trout. Tuna was the most frequently selected heart-healthy seafood item among females, as 69 percent (n=27/39) chose tuna (Table 6). Salmon and tuna were selected equally among males as the heart healthiest seafood item, as 85 percent (n=11/13) chose tuna and salmon (Table 5). The other heart healthy seafood items cod, mackerel, and trout were selected less often; however a greater percentage of males compared to females

chose cod, mackerel, and trout. Thirty-one percent (n=4/13) of males compared to 15 percent (n=6/39) of females selected mackerel. Forty-six percent (n=6/13) of males compared to 33 percent (n=13/39) of females chose cod. Fifty-four percent (n=7/13) of males compared to 5 percent (n=2/39) of females chose trout.

The less healthy seafood included lobster, fried catfish, fried crab cakes, bread/fried shrimp, and breaded/fried calamari. Twenty-three percent (n=3/13) of males and 10 percent (n=4/39) of females selected lobster. Zero percent (n=0/13) of males chose fried catfish, fried crab cakes, bread/fried shrimp, and breaded/fried calamari. Fifteen percent (n=6/39) of females chose bread/fried shrimp and 8 percent (n=3/39) chose fried crab cakes. Five percent (n=2/39) of females chose fried catfish and breaded/fried calamari.

Overall, both male and female participants were able to identify heart healthy foods. A greater percentage of males (59%) compared to females (58%) identified heart healthy grains. A greater percentage of females compared to males identified the healthier types of fruits and vegetables, as 62 percent of females compared to 48 percent of males identified healthier fruits and 57 percent of females compared to 53 percent of males identified healthier types of vegetables. A greater percentage of males (92%) compared to females (72%) were able to identify skim milk within the dairy group; however an equal percentage of males (54%) and females (54%) identified low-fat yogurt and low-fat cheese as heart healthy food items. In general, a greater percentage of females (58%) compared to males (55%) identified the healthier type of meats; although a greater percentage of males (60%) compared to females (40%) could identify the

healthier types of seafood. A greater percentage males (46%) compared to females (43%) identified heart healthy fats.

Which race was more likely to identify foods that promote cardiovascular health?

As mentioned, 41 of the participants were white, 7 were black, 1 was Hispanic, and 3 were multi-racial. The researcher did not have enough Hispanic or multi-racial participants to include in the statistical analysis. In addition, with only 7 black participants compared to 41 white participants, the researcher ran a chi-square test using GraphPad Software to determine if the differences in food choices within each food group chosen by white and black participants were statistically significant. Results for the chi-square test are shown in table seven. The P value for each food group is > 0.05; therefore, the differences between the black and white participant's food choices were not statistically significant (Table 7).

Table 7. Chi-Square Analysis of Food Choices among White (n=41) and Black (n=7) Participants.

Food Groups	χ^2	*df*	*p*
Dairy	16.07	9	0.0655
Grains	10.69	9	0.2976
Meat	10.19	9	0.3353
Vegetables	7.82	9	0.5524
Fats	7.18	9	0.6184
Seafood	6.52	9	0.6870
Fruits	2.33	9	0.9851

Even though there was not a statistically significant difference in the food choices among the white and black participants, both groups were able to identify heart healthy foods. Figure 8 shows the most frequently identified heart healthy foods among black and white participants. The graph shows a greater percentage of black participants compared to white participants were able to identify the heart healthy foods with the exception of apples.

Figure 8. Most frequently identified heart healthy foods between Black and White participants.

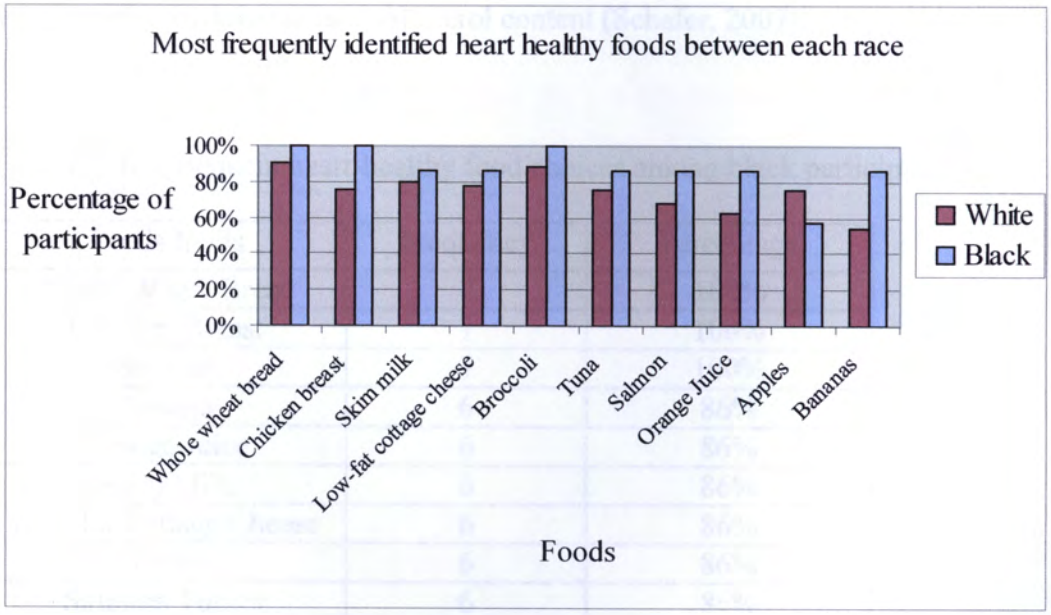


Table 8 shows the most frequently identified heart healthy food choices among black participants which were whole wheat bread, chicken breast, broccoli, banana, orange juice, skim milk, low-fat cottage cheese, liver, skinless turkey, tuna, and salmon. Whole wheat bread is considered to be heart healthy food due to the fiber and B complex associated with lowered cholesterol and

blood pressure (Hu, 2003). Broccoli, banana, and orange juice contain folate, vitamin C, and potassium which are associated with lowering cholesterol, blood pressure, and homocysteine levels (Lampe, 1999). Skim milk, low-fat cottage cheese, chicken breast, and skinless turkey are low in saturated fat which helps lower total cholesterol and low-density lipoprotein cholesterol levels (St-Onge, et al., 2000). Tuna and salmon support heart health due to the omega-3 fatty acids which are associated with lower triglyceride levels, blood pressure, and decreased rate of plaque growth in the arteries (American Heart Association, 2006). Even though six out of the seven black participants selected liver, it is not considered a heart healthy food due to its cholesterol content (Schafer, 2007).

Table 8. Most frequent heart-healthy food choices among black participants.

Foods Items	Frequency	Percentage
Whole Wheat Bread	7	100%
Chicken Breast	7	100%
Broccoli	7	100%
Banana	6	86%
Orange Juice	6	86%
Skim Milk	6	86%
Low-fat Cottage Cheese	6	86%
Liver	6	86%
Skinless Turkey	6	86%
Tuna	6	86%
Salmon	6	86%

The most frequently selected heart healthy food choices by white participants were whole wheat bread, broccoli, skim milk, low-fat cottage cheese, apples, tuna, chicken breast, skinless turkey, olive oil, salmon, canola oil, and orange juice (Table 9). Several of the most frequent heart healthy foods the white

participants chose are the same food the black participants chose with the exception of apples, olive oil, and canola oil. Apples are a good source of fiber, which is associated with lower cholesterol levels (Liu, et al., 2000). As olive oil and canola oil are good sources of the antioxidant vitamin E, which help prevent cells from damage (Hu, et al., 1999).

Several of the same heart healthy foods were chosen by both races. There was not much diversity within each food group. Brown rice, oatmeal, whole grain pasta, strawberries, blueberries, peaches, grapes juice, beets, garlic, low-fat yogurt, low-fat cheese, low-fat sour cream, pork tenderloin, lean beef,

Table 9. Most frequent heart-healthy food choices among white participants.

Food Items	Frequency	Percentage
Whole Wheat Bread	37	90%
Broccoli	36	88%
Skim Milk	33	80%
Low-fat Cottage Cheese	32	78%
Apples	31	76%
Tuna	31	76%
Chicken Breast	31	76%
Skinless Turkey	30	73%
Olive Oil	29	71%
Salmon	28	68%
Canola Oil	26	63%
Orange Juice	26	63%

almonds, peanut butter, mackerel, and cod were chosen less often even though they are considered to be heart healthy foods as well. According to Michels and Wolk (2002), a diverse selection of heart healthy foods will provide the wide variety of nutrients essential to heart health.

The ideal heart healthy answers for question six on the questionnaire included whole wheat bread, brown rice, plain oatmeal, and whole grain pasta. Both white and black participants were able to identify the heart healthy food choices. Whole wheat bread was the most frequently chosen food item from the bread group, as 90 percent (n=37/41) of white participants and 100 percent (n=7/7) of black participants chose whole wheat bread (Tables 10 & 11). The white and black participants selected the other heart health grains, oatmeal, brown rice, and whole grain pasta less often compared to whole wheat bread. Fifty-six percent (n=23/41) of white participants and 57 percent (n=4/7) of black participants chose oatmeal. Forty-four percent (n=18/41) of white participants and 57 percent (n=4/7) of black participants selected brown rice. Thirty-four percent (n=14/41) of white participants and 29 percent (n=2/7) of black participants chose whole grain pasta.

The less healthy grain products were white bread, crackers, white rice, doughnuts, egg noodles, and a regular muffin. Zero percent (n=0/41) of white participants and black participants (n=0/7) chose white bread. Five percent (n=2/41) of white participants selected crackers and white rice. Twenty-nine percent (n=2/7) of black participants selected crackers, white rice, and a regular muffin. Two percent (n=1/41) of white participants chose doughnuts, egg noodles, and a regular muffin. Fourteen percent (n=1/7) of black participants choose douga hnuts and egg noodles.

The ideal heart healthy answers for question seven on the questionnaire included strawberries, banana, grape juice, orange juice, canned peaches in juice, blueberries, and apples. Apples were the most frequently chosen heart healthy

Table 10. Frequency and percentage of food choices among White participants.

Grains	Frequency	Percentage	Meat	Frequency	Percentage
Whole Wheat Bread	37	90%	Chicken Breast	31	76%
Oatmeal	23	56%	Skinless turkey	30	73%
Brown rice	18	44%	Lean Beef	26	63%
Whole Grain Pasta	14	34%	Pork tenderloin	11	27%
Crackers	2	5%	Liver	10	24%
White rice	2	5%	Bologna	3	7%
Doughnuts	1	2%	Bacon	2	5%
Egg Noodles	1	2%	Fried Chicken	1	2%
Regular Muffin	1	2%	Hot dogs	1	2%
White bread	0	0%	Sausage	0	0%
Fruits	Frequency	Percentage	Fats	Frequency	Percentage
Apples	31	76%	Olive Oil	29	71%
Orange Juice	26	63%	Canola Oil	26	63%
Banana	22	54%	Peanut Butter	16	39%
Blueberries	19	46%	Almonds	15	37%
Strawberries	19	46%	Margarine	7	17%
Grape juice	14	34%	Corn Oil	5	12%
Peaches, juice	6	15%	Coconut oil	2	5%
Coconut	3	7%	Butter	1	2%
Pears, syrup	3	7%	Lard	0	0%
Oranges, syrup	0	0%	Shortening	0	0%
Vegetables	Frequency	Percentage	Seafood	Frequency	Percentage
Broccoli	36	88%	Tuna	31	76%
Spinach	25	61%	Salmon	28	68%
Tomato	22	54%	Cod	15	37%
Iceberg lettuce	17	41%	Trout	7	17%
Garlic	16	39%	Mackerel	6	15%
Beets	15	37%	Lobster	5	12%
Canned Peas	8	20%	Breaded/Fried shrimp	3	7%
Canned corn	3	7%	Fried crab cakes	1	2%
Dill pickle	3	7%	Breaded/Fried calamari	1	2%
Sauerkraut	1	2%	Fried catfish	0	0%
Dairy	Frequency	Percentage			
Skim Milk	33	80%			
Low-fat cottage cheese	32	78%			
Low-fat yogurt	22	54%			
Low-fat cheese	21	51%			
Low-fat sour cream	11	27%			
Regular yogurt	9	22%			
Regular cottage cheese	4	10%			
Ice cream	1	2%			
Whole milk	1	2%			
Regular sour cream	0	0%			

Table 11. Frequency and percentage of food choices among Black participants.

Grains	Frequency	Percentage	Meat	Frequency	Percentage
Whole Wheat Bread	7	100%	Chicken Breast	7	100%
Brown Rice	4	57%	Liver	6	86%
Oatmeal	4	57%	Skinless turkey	6	86%
Whole Grain Pasta	2	29%	Lean Beef	2	29%
Regular Muffin	2	29%	Bologna	2	29%
Crackers	2	29%	Sausage	1	14%
White rice	2	29%	Hot dogs	1	14%
Egg Noodles	1	14%	Pork tenderloin	1	14%
Doughnuts	1	14%	Bacon	0	0%
White bread	0	0%	Fried Chicken	0	0%
Fruits	Frequency	Percentage	Fats	Frequency	Percentage
Banana	6	86%	Olive Oil	4	57%
Orange Juice	6	86%	Corn Oil	3	43%
Apples	4	57%	Peanut Butter	3	43%
Grape juice	4	57%	Margarine	2	29%
Blueberries	3	43%	Canola Oil	2	29%
Strawberries	3	43%	Almonds	2	29%
Peaches, juice	2	29%	Butter	1	14%
Coconut	1	14%	Coconut oil	0	0%
Pears, syrup	1	14%	Lard	0	0%
Oranges, syrup	0	0%	Shortening	0	0%
Vegetables	Frequency	Percentage	Seafood	Frequency	Percentage
Broccoli	7	100%	Tuna	6	86%
Spinach	5	71%	Salmon	6	86%
Beets	5	71%	Mackerel	3	43%
Iceberg lettuce	5	71%	Cod	3	43%
Garlic	4	57%	Trout	2	29%
Tomato	3	43%	Breaded/Fried shrimp	2	29%
Canned Peas	2	29%	Lobster	2	29%
Canned corn	2	29%	Fried catfish	1	14%
Sauerkraut	1	14%	Breaded/Fried calamari	0	0%
Dill pickle	0	0%	Fried crab cakes	0	0%
Dairy	Frequency	Percentage			
Skim Milk	6	86%			
Low-fat cottage cheese	6	86%			
Low-fat sour cream	5	71%			
Low-fat yogurt	4	57%			
Low-fat cheese	4	57%			
Regular yogurt	4	57%			
Whole milk	3	43%			
Regular cottage cheese	2	29%			
Ice cream	1	14%			
Regular sour cream	1	14%			

food from the fruit group among white participants, as 76 percent (n=31/41) of white participants selected apples compared to 57 percent (n=4/7) of black participants. Orange juice and bananas were the most frequently chosen heart healthy food from the fruit group among black participants, as 86 percent (n=6/7) of black participants choose orange juice and bananas compared to 63 percent (n=26/41) of white participants chose orange juice and 54 percent (n=22/41) of white participant chose bananas.

Fruits such as blueberries, strawberries, peaches, and grape juice were chosen less often among both black and white participants (Tables 10 & 11). Forty-six percent (n=19/41) of white participants selected strawberries and blueberries. Forty-three percent (n=3/7) of black participants chose strawberries and blueberries. Thirty-four percent (n=14/41) of white participants and 57 percent (n=4/7) of black participants selected grape juice. Fifteen percent (n=6/41) of white participants and 29 percent (n=2/7) of black participants chose peaches in juice.

The less healthy fruits were coconut, pears in syrup, and oranges in syrup. Seven percent (n=3/41) of white participants chose coconut and pears in syrup. Fourteen percent (n=1/7) of black participants selected coconut and pears in syrup. Zero percent of white (n=0/41) and black (n=0/7) participants chose oranges in syrup.

The ideal heart healthy answers for question eight on the questionnaire included tomato, spinach, broccoli, garlic, and beets. Broccoli was the most frequently selected vegetable among both white and black participants, as 100 percent (n=7/7) of black participants and 88 percent (n=36/41) of white

participants selected broccoli (Tables 10 & 11). Spinach was selected more frequently among black participants compare to white participants, as 71 percent (n=5/7) of black participants and 61 percent (n=25/41) of white participants chose spinach. Fifty-four percent (n=22/41) of white participants and 43 percent (n=3/7) of black participants selected tomato. Thirty-nine percent (n=16/41) of white participants and 57 percent (n=4/7) of black participants chose garlic. Thirty-seven percent (n=15/41) of white participants and 71 percent (n=5/7) of black participants selected beets.

The less healthy vegetables were iceberg lettuce, canned corn, dill pickle, sauerkraut, and canned peas. Even though iceberg lettuce is not generally considered a heart healthy food due to its low nutrient content, 71 percent (n=5/7) of black participants chose iceberg lettuce compared to 41 percent (n=17/41) of white participants. Seven percent (n=3/41) of white participants selected canned corn and dill pickle. Twenty-nine percent (n=2/7) of black participants chose canned corn and zero percent (n=0/7) of black participants chose dill pickle. Two percent (n=1/41) of white participants and 14 percent (n=1/7) of black participants selected sauerkraut. Twenty percent (n=8/41) of white participants and 29 percent (n=2/7) of black participants chose canned peas.

The ideal heart healthy answers for question nine on the questionnaire included skim milk, low-fat cottage cheese, low-fat yogurt, low-fat cheese, and low-fat sour cream. Skim milk was the most frequently selected heart healthy food from the dairy group among white participants and skim milk and low-fat cottage cheese were the most frequently chosen heart healthy food items among black participants, as 86 percent (n=6/7) of black participants identified skim milk

and low-fat cottage cheese as heart healthy, 80 percent (n=33/41) of white participants identified skim milk and 78 percent (n=32/41) of white participants selected low-fat cottage cheese as heart healthy (Tables 10 & 11). With the exception of low-fat sour cream, results were similar in choosing heart-healthy dairy items among both black and white participants. Fifty-four percent (n=22/41) of white participants and 57 percent (n=4/7) of black participants chose low-fat yogurt. Fifty-one percent (n=21/41) of white participants and 57 percent (n=4/7) of black participants selected low-fat cheese. Seventy-one percent (n=5/7) of black participants compared to 27 percent (n=11/41) of white participants chose low-fat sour cream.

The less healthy choices included regular yogurt, ice cream, whole milk, regular sour cream, and regular cottage cheese. Twenty-two percent (n=9/41) of white participants and 57 percent (n=4/7) of black participants chose regular yogurt. Two percent (n=1/41) of white participants chose ice cream and whole milk. Fourteen percent (n=1/7) of black participants chose ice cream and 43 (n=3/7) percent chose whole milk. Zero percent (n=0/41) of white participants and 14 percent (n=1/7) of black participants choose regular sour cream. Ten percent (n=4/40) of white participants and 29 percent (n=2/7) of black participants chose regular cottage cheese.

The ideal heart healthy answers for question ten on the questionnaire included chicken breast, lean beef, skinless turkey, and pork tenderloin. A greater percentage of black participants compared to white participants were able to identify chicken breast as a heart healthy, as 100 percent (n=7/7) of black participants and 76 percent (n=31/41) of white participants identified chicken

breast (Tables 10 & 11). Black participants and white participants were able to identify skinless turkey as heart healthy also, as 86 percent (n=6/7) of black participants and 73 percent (n=30/41) of white participants chose skinless turkey. Sixty-three percent (n=26/41) of white participants and 29 percent (n=2/7) of black participants identified lean beef as heart healthy. Twenty-seven percent (n=11/41) of white participants and 14 percent (n=1/7) of black participants chose pork tenderloin as heart healthy.

The less heart healthy meats included bacon, sausage, liver, fried chicken, hot dogs, and bologna. Five percent (n=2/41) of white participants and zero percent (n=0/7) of black participants selected bacon. Zero percent (n=0/41) of white participants and 14 percent (n=1/7) of black participants selected sausage. Even though liver is not considered a heart healthy food due to its high cholesterol content, 86 percent (n=6/7) of black participants and 24 percent (n=10/41) of white participants chose liver as heart healthy. Two percent (n=1/41) of white participants selected fried chicken and hot dogs. Zero percent (n=0/7) of black participants chose fried chicken and 14 percent (n=1/7) chose hot dogs. Seven percent (n=3/41) of white participants and 29 percent (n=2/7) of black participants selected bologna.

The ideal heart healthy answers for question 11 on the questionnaire included olive oil, canola oil, almonds, corn oil, and peanut butter. Olive oil was the most frequently selected heart healthy fat among black and white participants, as 57 percent (n=4/7) of black participants chose olive oil compared to 71 percent (n=29/41) of white participants (Tables 10 & 11). Forty-three percent (n=3/7) of black participants identified corn oil and peanut butter as heart healthy, while 12

percent (n=5/41) of white participants identified corn oil and 39 percent of white participants (n=16/41) identified peanut butter as heart healthy. Sixty-three percent (n=26/41) of white participants and 29 percent (n=2/7) of black participants selected canola oil as heart healthy. Thirty-seven percent (n=15/41) of white participants and 29 percent (n=2/7) of black participants chose almonds as heart healthy fat.

The less heart healthy fats included coconut oil, butter, margarine, lard, and shortening. Five percent (n=2/41) of white participants and 0 percent (n=0/7) of black participants selected coconut oil. Two percent (n=1/41) of white participants and 14 percent (n=1/7) of black participants chose butter. Seventeen percent (n=7/41) of white participants and 29 percent (n=2/7) of black participants selected margarine. Zero percent (n=0/41) of white and black (n=0/7) participants chose lard or shortening as heart healthy fats.

The ideal heart healthy answers to question 12 on the questionnaire included tuna, salmon, mackerel, cod, and trout. Tuna was the most frequently selected heart healthy seafood item among white participants, as 76 percent (n=31/41) chose tuna (Table 10). Salmon and tuna were the most frequently identified seafood items among black participants, as 86 percent (n=6/7) of black participants chose salmon and tuna. Sixty-eight percent (n=28/41) of white participants chose salmon as a heart healthy seafood item. Mackerel, cod, and trout were selected less often compared to salmon and tuna. Fifteen percent (n=6/41) of white participants and 43 percent (n=3/7) of black participants selected mackerel as heart healthy. Thirty-seven percent (n=15/41) of white participants and 43 percent (n=3/7) of black participants chose cod as heart

healthy. Seventeen percent (n=7/41) of white participants and 29 percent (n=2/7) of black participants selected trout as heart healthy.

The less heart healthy seafood items were lobster, fried catfish, fried crab cakes, breaded and fried shrimp, and breaded and fried calamari. Seven percent (n=3/41) of white participants chose fried shrimp, as 2 percent (n=1/41) chose fried crab cakes. Twenty-nine percent (n=2/7) of black participants selected lobster and breaded and fried shrimp. Twelve percent (n=5/41) of white participants chose lobster and zero percent (n=0/7) of black participants chose fried crab cakes. Zero percent (n=0/41) of white participants selected fried catfish, as zero percent (n=0/7) of black participants selected breaded and fried calamari. Two percent (n=1/41) of white participants chose breaded and fried calamari and 14 percent (n=1/7) of black participants chose fried catfish.

How accurate are those with known cardiovascular disease and those without known cardiovascular disease at identifying foods that promote cardiovascular health?

To determine if there was a statistically significant difference between the food choices of participants with and without known cardiovascular disease a chi-square test was used (Table 12). The P values for each food group were > 0.05; therefore, there was not a statically significant difference between the two groups of participants.

Groups of participants, those with known cardiovascular disease and those without known cardiovascular disease, were able to identify foods that promote cardiovascular health. However, a greater percentage of participants with known

cardiovascular disease were able to identify heart healthy food choices compared to those participants without known cardiovascular disease (Figure 9).

Table 12. Chi-Square Analysis of Food Choices among Participants with (n=35) and without (n=17) Known CVD.

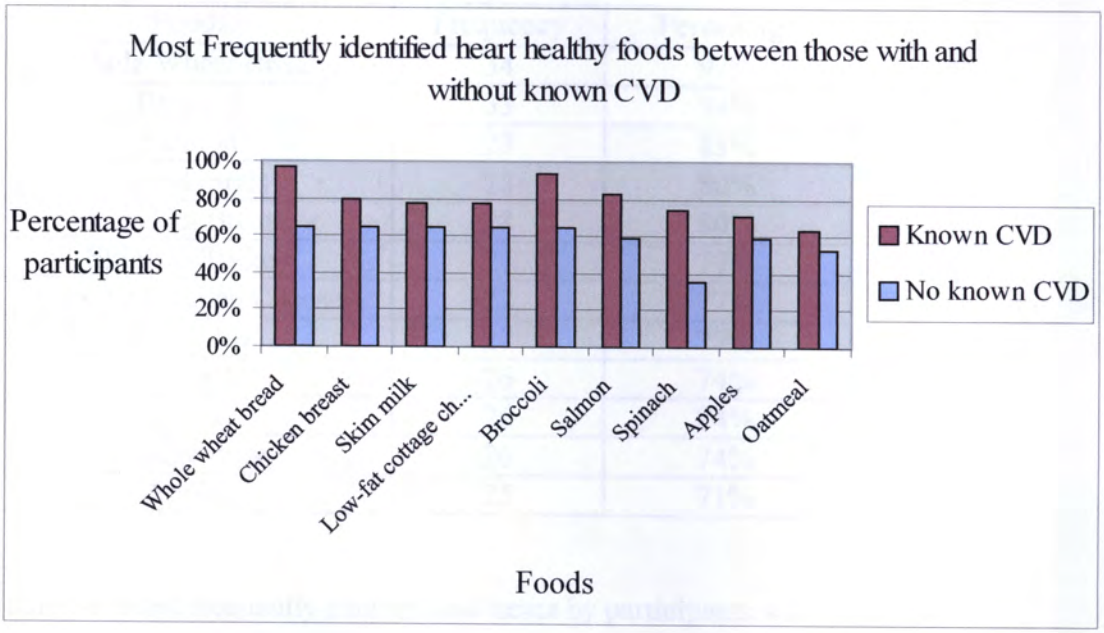
Food Groups	χ^2	*df*	*p*
Fats	13.71	9	0.1330
Seafood	14.15	9	0.1711
Meat	6.94	9	0.6434
Fruits	5.96	9	0.7439
Grains	4.39	9	0.8839
Dairy	3.47	9	0.9427
Vegetables	2.33	9	0.9851

The most frequently chosen food items among the participants with known cardiovascular disease were whole wheat bread, broccoli, salmon, strawberries, chicken breast, skinless turkey, low-fat cottage cheese, skim milk, spinach, tuna, orange juice, and apples (Table 13). Whole wheat bread and broccoli are good sources of fiber and folate, which are associated with lowered cholesterol levels according to Hu (2003) and Tucker et al. (1996). Strawberries, orange juice, and spinach contain antioxidants, which help prevent cells from damage (Liu, et al., 2000).

Salmon and tuna are sources of omega-3 fatty acids, which are associated with lowering blood pressure and triglycerides (American Heart Association,

2006). Chicken breast, skinless turkey, low-fat cottage cheese, and skim milk are low in saturated fat known to be associated with lower cholesterol levels (St-Onge, et al., 2003).

Figure 9. Most frequently identified heart healthy foods between participants with and without known cardiovascular disease.



The most commonly selected heart healthy food items among participants without known cardiovascular disease were whole wheat bread, broccoli, skim milk, low-fat cottage cheese, olive oil, chicken breast, orange juice, apples, salmon, oatmeal, bananas, and low-fat cheese (Table 14). Several of these food choices by participants without known cardiovascular disease are the same as the food choices by the participants with known cardiovascular disease, with the exception of oatmeal, banana, and low-fat cheese.

Oatmeal is a good source of soluble fiber to help control cholesterol levels (Marlett, et al., 2002). Bananas are a good source of potassium to help control blood pressure (Appel, et al., 1997). Low-fat cheese is low in saturated fat, which is associated with lowered cholesterol levels (St-Onge, et al., 2003).

Table 13. Most frequently chosen food items by participants with known cardiovascular disease.

Foods	Frequency	Percentage
Whole Wheat Bread	34	97%
Broccoli	33	94%
Salmon	29	83%
Strawberries	28	80%
Chicken Breast	28	80%
Skinless Turkey	27	77%
Low-fat Cottage Cheese	27	77%
Skim Milk	27	77%
Spinach	26	74%
Tuna	26	74%
Orange juice	26	74%
Apples	25	71%

Table 14. Most frequently chosen food items by participants without known cardiovascular disease.

Foods	Frequency	Percentage
Whole Wheat Bread	11	65%
Broccoli	11	65%
Skim Milk	11	65%
Low-fat Cottage Cheese	11	65%
Olive Oil	11	65%
Chicken Breast	11	65%
Orange Juice	10	59%
Apples	10	59%
Salmon	10	59%
Oatmeal	9	53%
Banana	9	53%
Low-fat Cheese	9	53%

The ideal heart healthy answers for question six on the questionnaire included whole wheat bread, brown rice, plain oatmeal, and whole grain pasta. Whole wheat bread was once again the most frequently chosen heart healthy bread item among participants with and without known cardiovascular disease. While 97 percent (n=34/35) of participants with known cardiovascular disease were able to identify whole wheat bread as heart healthy, 65 percent (n=11/17) of participants without known cardiovascular identified whole wheat bread as heart healthy (Tables 15 & 16). Fifty-three percent (n=9/17) of participants without known cardiovascular disease and 63 percent (n=22/35) of participants with known cardiovascular disease identified oatmeal as heart healthy. Thirty five percent (n=6/17) of participants without known cardiovascular disease and 48 percent (n=17/35) of participants with known cardiovascular disease selected brown rice. Forty-one percent (n=7/17) of participants without known cardiovascular disease and 34 percent (n=12/35) of participants with known cardiovascular disease chose whole grain pasta.

The less heart healthy grains included white bread, crackers, white rice, doughnuts, egg noodles, and a regular muffin. Six percent (n=1/17) of participants without known cardiovascular disease and 11 percent (n=4/35) of participants with known cardiovascular disease selected white rice as heart healthy. Zero percent (n=0/17) of participants without known cardiovascular disease chose white bread, crackers, doughnuts, egg noodles, or a regular muffin as heart healthy. Six percent (n=2/35) of participants with known cardiovascular disease selected crackers as three percent (n=1/35) selected white bread, doughnuts, and

Table 15. Frequency and percentages of food choices among participants without known CVD.

Grains	Frequency	Percentage	Meat	Frequency	Percentage
Whole Wheat Bread	11	65%	Chicken Breast	11	65%
Oatmeal	9	53%	Skinless turkey	9	53%
Whole Grain Pasta	7	41%	Lean Beef	8	47%
Brown Rice	6	35%	Liver	4	23%
White rice	1	6%	Fried Chicken	1	6%
White bread	0	0%	Pork tenderloin	1	6%
Doughnuts	0	0%	Bologna	1	6%
Egg Noodles	0	0%	Sausage	0	0%
Crackers	0	0%	Hot dogs	0	0%
Regular Muffin	0	0%	Bacon	0	0%
Fruits	Frequency	Percentage	Fats	Frequency	Percentage
Orange Juice	10	59%	Olive Oil	11	65%
Apples	10	59%	Canola Oil	7	41%
Banana	9	53%	Peanut Butter	6	35%
Grape juice	5	29%	Almonds	5	29%
Strawberries	5	29%	Margarine	3	18%
Blueberries	4	23%	Corn oil	3	18%
Peaches, juice	3	18%	Coconut oil	2	12%
Coconut	2	12%	Butter	0	0%
Pears, syrup	0	0%	Lard	0	0%
Oranges, syrup	0	0%	Shortening	0	0%
Vegetables	Frequency	Percentage	Seafood	Frequency	Percentage
Broccoli	11	65%	Salmon	10	59%
Tomato	7	41%	Tuna	8	47%
Spinach	6	35%	Cod	7	41%
Garlic	6	35%	Mackerel	5	29%
Beets	5	29%	Trout	4	24%
Iceberg lettuce	5	29%	Lobster	3	18%
Canned Peas	3	18%	Fried catfish	0	0%
Canned corn	1	6%	Fried crab cakes	0	0%
Dill pickle	0	0%	Breaded/Fried calamari	0	0%
Sauerkraut	0	0%	Breaded/Fried shrimp	0	0%
Dairy	Frequency	Percentage			
Skim Milk	11	65%			
Low-fat cottage cheese	11	65%			
Low-fat cheese	9	53%			
Low-fat yogurt	6	35%			
Low-fat sour cream	5	29%			
Regular yogurt	5	29%			
Regular cottage cheese	2	12%			
Ice cream	0	0%			
Whole milk	0	0%			
Regular sour cream	0	0%			

Table 16. Frequency and percentage of food choices among participants with known CVD.

Grains	Frequency	Percentage	Meat	Frequency	Percentage
Whole Wheat Bread	34	97%	Chicken Breast	28	80%
Oatmeal	22	63%	Skinless turkey	27	77%
Brown Rice	17	48%	Lean Beef	21	60%
Whole Grain Pasta	12	34%	Liver	13	37%
White rice	4	11%	Pork tenderloin	12	34%
Regular Muffin	3	9%	Bacon	3	9%
Crackers	2	6%	Bologna	2	6%
Egg Noodles	1	3%	Hot dogs	1	3%
White bread	1	3%	Sausage	1	3%
Doughnuts	1	3%	Fried chicken	0	0%
Fruits	Frequency	Percentage	Fats	Frequency	Percentage
Strawberries	28	80%	Olive Oil	24	69%
Orange Juice	26	74%	Canola Oil	23	66%
Apples	25	71%	Almonds	14	40%
Banana	23	66%	Peanut Butter	13	37%
Blueberries	20	57%	Corn Oil	5	14%
Grape juice	14	40%	Margarine	5	14%
Peaches, juice	4	11%	Butter	3	9%
Pears, syrup	3	9%	Coconut oil	0	0%
Coconut	3	9%	Lard	0	0%
Oranges, syrup	0	0%	Shortening	0	0%
Vegetables	Frequency	Percentage	Seafood	Frequency	Percentage
Broccoli	33	94%	Salmon	29	83%
Spinach	26	74%	Tuna	26	74%
Tomato	18	51%	Cod	13	37%
Iceberg lettuce	18	51%	Mackerel	8	23%
Garlic	17	49%	Trout	7	20%
Beets	16	46%	Breaded/Fried shrimp	5	14%
Canned Peas	6	17%	Lobster	4	11%
Canned Corn	3	9%	Fried catfish	2	6%
Dill pickle	2	6%	Breaded/Fried calamari	0	0%
Sauerkraut	1	3%	Fried crab cakes	0	0%
Dairy	Frequency	Percentage			
Skim Milk	27	77%			
Low-fat cottage cheese	27	77%			
Low-fat yogurt	21	60%			
Low-fat cheese	19	54%			
Low-fat sour cream	13	37%			
Regular yogurt	9	26%			
Whole milk	4	11%			
Regular cottage cheese	4	11%			
Ice cream	1	3%			
Regular sour cream	1	3%			

egg noodles. Nine percent (n=3/35) of participants with known cardiovascular disease chose a regular muffin as heart healthy.

The ideal heart healthy answers for question seven on the questionnaire included strawberries, banana, grape juice, orange juice, canned peaches in juice, blueberries, and apples. Strawberries were the most frequently chosen fruit item among the participants with known cardiovascular disease (Table 16). Eighty percent (n=28/35) of those with known cardiovascular disease chose strawberries compared to 29 percent (n=5/17) of participants without known cardiovascular disease. Orange juice and apples were the most frequently selected heart healthy fruit item among participants without known cardiovascular disease, as 59 percent (n=10/17) of those participants chose orange juice and apples (Table 15).

However, 74 percent (n=26/35) of participants with known cardiovascular disease identified orange juice and 71 percent (n=25/35) identified apples as a heart healthy food item. Fifty-three percent (n=9/17) of participants without known cardiovascular disease and 66 percent (n=23/35) of participants with known cardiovascular disease selected banana as heart healthy.

The heart healthy fruits blueberries, grape juice, and peaches in juice were selected less often among participants with and without known cardiovascular disease. Twenty-three percent (n=4/17) of participants without known cardiovascular disease and 57 percent (n=20/35) of participants with known cardiovascular disease chose blueberries. Twenty-nine percent (n=5/17) of participants without known cardiovascular disease and 40 percent (n=14/35) of participants with known cardiovascular disease identified grape juice. Eighteen percent (n=3/17) of participants without known cardiovascular disease and 11

percent (n=4/35) of participants with known cardiovascular disease chose peaches in juice as heart healthy.

The less heart healthy fruits included coconut, pears in syrup, and oranges in syrup. Twelve percent (n=2/17) of participants without known cardiovascular disease and 9 percent (n=3/35) of participants with known cardiovascular disease selected coconut. Zero percent (n=0/17) of participants without known cardiovascular disease chose pears in syrup and oranges in syrup. Nine percent (n=3/35) of participants with known cardiovascular disease selected pears in syrup and zero percent (n=0/35) selected oranges in syrup.

The ideal heart healthy answers for question eight on the questionnaire included tomato, spinach, broccoli, garlic, and beets. Broccoli was the most frequently identified heart healthy food item from the vegetable group among participants with known cardiovascular disease and among participants without known cardiovascular disease (Tables 15 &16). Ninety-four percent (n=33/35) of participants with known cardiovascular disease identified broccoli as heart healthy compared to 65 percent (n=11/17) of participants without known cardiovascular disease. In addition, 74 percent (n=26/35) of participants with known cardiovascular disease identified spinach as heart healthy compared to 35 percent (n=6/17) of participants without known cardiovascular disease. Forty-one percent (n=7/17) of participants without known cardiovascular disease and 51 percent (n=18/35) of participants with known cardiovascular disease selected tomato. Thirty-five percent (n=6/17) of participants without known cardiovascular disease and 49 percent (n=17/35) of participants with known cardiovascular disease identified garlic as heart healthy. Twenty-nine percent (n=5/17) of

participants without known cardiovascular disease and 46 percent (n=16/35) of participants without known cardiovascular disease chose beets as heart healthy.

The less heart healthy vegetables included iceberg lettuce, canned corn, dill pickle, sauerkraut, and canned peas. Twenty-nine percent (n=5/17) of participants without known cardiovascular disease and 51 percent (n=18/35) of participants with known cardiovascular disease selected iceberg lettuce. Six percent (n=1/17) of participants without known cardiovascular disease and 9 percent (n=3/35) of participants with known cardiovascular disease chose canned corn. Six percent (n=2/35) of participants with known cardiovascular disease selected dill pickle, while 3 percent (n=1/35) selected sauerkraut. Zero percent (n=0/17) of participants without known cardiovascular disease selected dill pickle and sauerkraut. Eighteen percent (n=3/17) of participants without known cardiovascular disease and seventeen percent (n=6/35) of participants with known cardiovascular disease chose canned peas.

The ideal heart healthy answers for question nine on the questionnaire included skim milk, low-fat cottage cheese, low-fat yogurt, low-fat cheese, and low-fat sour cream. Low-fat cottage cheese and skim milk were the most frequently identified heart healthy food item in the dairy group among participants with and without known cardiovascular disease (Tables 15 & 16). Seventy-seven percent (n=27/35) of participants with known cardiovascular disease identified skim milk and low-fat cottage cheese as heart healthy (Table 16). Sixty-five percent (n=11/17) of participants without known cardiovascular disease identified skim milk and low-fat cottage cheese as heart healthy (Table 15). Thirty-five percent (n=6/17) of participants without known cardiovascular

disease and 60 percent (n=21/35) of participants with known cardiovascular disease selected low-fat yogurt. Fifty-three percent (n=9/17) of participants without known cardiovascular disease and 54 percent (n=19/35) of participants with known cardiovascular disease chose low-fat cheese. Twenty-nine percent (n=5/17) of participants without known cardiovascular disease and 37 percent (n=13/35) of participants with known cardiovascular disease identified low-fat sour cream as heart healthy.

The less heart healthy dairy items were regular yogurt, ice cream, whole milk, regular sour cream, and regular cottage cheese. Twenty-nine percent (n=5/17) of participants without known cardiovascular disease and 26 percent (n=9/35) of participants with known cardiovascular disease selected regular yogurt. Zero percent (n=0/17) of participants without known cardiovascular disease selected ice cream, whole milk, or regular sour cream as heart healthy. Three percent (n=1/35) of participants with known cardiovascular disease chose ice cream and regular sour cream as 11 percent (n=4/35) chose whole milk and regular cottage cheese. Twelve percent (n=2/17) of participants without known cardiovascular disease selected regular cottage cheese.

The ideal heart healthy answers for question ten on the questionnaire included chicken breast, lean beef, skinless turkey, and pork tenderloin. Chicken breast was the most frequently selected heart healthy food item from the meat group among both groups of participants. Sixty-five percent (n=11/17) of participants without known cardiovascular disease and 80 percent (n=28/35) of participants with known cardiovascular disease choose chicken breast (Tables 15 & 16). Fifty-three percent (n=9/17) of participants without known cardiovascular

disease and 77 percent (n=27/35) of participants with known cardiovascular disease identified skinless turkey as heart healthy. Forty-seven percent (n=8/17) of participants without known cardiovascular disease and 60 percent (n=21/35) of participants with known cardiovascular disease selected lean beef. Six percent (n=1/17) of participants without known cardiovascular disease and 34 percent (n=12/35) of participants with known cardiovascular disease chose pork tenderloin as heart healthy.

The less heart healthy meats included bacon, sausage, liver, fried chicken, hot dogs, and bologna. Zero percent (n=0/17) of participants without known cardiovascular disease selected bacon, sausage, or hot dogs. Three percent (n=1/35) of participants with known cardiovascular disease selected sausage and hot dogs, as 0 percent (n=0/35) selected fried chicken. Nine percent (n=3/35) of participants with known cardiovascular disease chose bacon and six percent (n=2/35) chose bologna. Six percent (n=1/17) of participants without known cardiovascular disease selected fried chicken and bologna as heart healthy. Twenty-four percent (n=4/17) of participants without known cardiovascular disease and 37 percent (n=13/35) of participants with known cardiovascular disease chose liver as a heart healthy meat item.

The ideal heart healthy answers for question 11 on the questionnaire included olive oil, canola oil, almonds, corn oil, and peanut butter. Olive oil was the most frequently selected heart healthy fat among participants with and without known cardiovascular disease, as 65 percent (n=11/17) of participants without known cardiovascular disease and 69 percent (n=24/35) of participants with known cardiovascular disease choose olive oil (Tables 15 & 16). Forty-one

percent (n=7/17) of participants without known cardiovascular disease and 66 percent (n=23/35) of participants with known cardiovascular disease selected canola oil. Thirty-five percent (n=6/17) of participants without known cardiovascular disease and 37 percent (n=13/35) of participants with known cardiovascular disease chose peanut butter. Twenty-nine percent (n=5/17) of participants without known cardiovascular disease and 40 percent (n=14/35) of participants with known cardiovascular disease identified almonds as heart healthy. Eighteen percent (n=3/17) of participants without known cardiovascular disease and 14 percent (n=5/35) of participants with known cardiovascular disease chose corn oil.

The less heart healthy fats included coconut oil, butter, margarine, lard, and shortening. Twelve percent (n=2/17) of participants without known cardiovascular disease and zero percent (n=0/35) of participants with known cardiovascular disease selected coconut oil. Zero percent (n=0/17) of participants without known cardiovascular disease and 9 percent (n=3/35) of participants with known cardiovascular disease selected butter. Eighteen percent (n=3/17) of participants without known cardiovascular disease and 14 percent (n=5/35) of participants with known cardiovascular disease chose margarine. Zero percent (n=0/17) of participants with and without (n=0/35) known cardiovascular disease chose lard or shortening as a heart healthy fat.

The ideal heart healthy answers to question 12 on the questionnaire included tuna, salmon, mackerel, cod, and trout. Salmon was the most frequently identified heart healthy seafood item among participants with and without known cardiovascular disease (Tables 15 & 16). Eighty-three percent (n=29/35) of

participants with known cardiovascular disease identified salmon as heart healthy, while 59 percent (n=10/17) of participants without known cardiovascular disease identified salmon as heart healthy. Forty-seven percent (n=8/17) of participants without known cardiovascular disease and 74 percent (n=26/35) of participants with known cardiovascular disease chose tuna. Forty-one percent (n=7/17) of participants without known cardiovascular disease and 37 percent (n=13/35) of participants with known cardiovascular disease selected cod. Twenty-nine percent (n=5/17) of participants without known cardiovascular disease and 23 percent (n=8/35) of participants with known cardiovascular disease selected mackerel. Twenty-four percent (n=4/17) of participants without known cardiovascular disease and 20 percent (n=7/35) of participants with known cardiovascular disease chose trout.

The less heart healthy seafood items included lobster, fried catfish, fried crab cakes, breaded and fried shrimp, and breaded and fried calamari. Eighteen percent (n=3/17) of participants without known cardiovascular disease and 11 percent (n=4/35) of participants with known cardiovascular disease selected lobster. Six percent (n=2/35) of participants with known cardiovascular disease selected fried catfish and zero percent (n=0/35) selected fried crab cakes and breaded and fried calamari. However, 14 percent (n=5/35) of participants with known cardiovascular disease chose breaded and fried shrimp. Zero percent (n=0/17) of participants without known cardiovascular disease selected fried catfish, fried crab cakes, breaded and fried shrimp, and breaded and fried calamari.

Focus Group Interview

After the questionnaires were completed, the researcher asked for volunteers to participate in a focus group session at three of the senior nutrition sites. Sixteen white females volunteered. Out of the 16 volunteers, 2 did not answer any of the questions despite the researcher's efforts to engage them in conversation.

The following section documents the participants' responses to the focus group sessions. There was not enough information provided by the participants to enable the researcher to categorize the responses into themes. Instead, the information was reported as responses. When asked which foods from the bread group they thought were the healthiest for the heart, 1 participant stated, "Anything brown." Another participant replied, "brown bread." Overall, 4 participants identified whole grains and 5 mentioned whole wheat bread. Individual responses included oatmeal, raisin bread, and "no white flour." Two participants identified white bread as a heart-healthy and 1 participant identified butternut bread as heart-healthy.

When the participants were asked which fruits or fruit juices they thought were the healthiest choices for the heart, 6 participants mentioned berries, 4 identified apples, and 6 replied bananas. Individual responses included grapes, melon, and dates. Four participants replied with orange juice, 1 participant mentioned apple juice, and 1 participant mentioned V-8 juice. One participant stated, "Fruit in the can has too much sugar." Another participant stated, "Canned fruit is fine because it comes in juice."

When asked which types of vegetables are healthiest for the heart, 1 participant stated, "Green or yellow vegetables." Another participant replied, "Dark colored vegetables." Two participants said, "Green vegetables." Three participants mentioned sweet potatoes, 2 participants mentioned broccoli, and 2 participants mention potatoes. Individual responses to heart healthy vegetables included corn-on-the-cob, tomatoes, peppers, green beans and lima beans.

When the participants where asked which types of meat products are healthiest for the heart 5 participants mentioned chicken. Three of those participants specified chicken breast as healthy, 1 participant specified baked chicken, 1 participant specified grilled chicken, and another participant replied, "Chicken without the skin." Four participants identified salmon as heart healthy. Individual responses included lobster, shrimp, and "tuna in the can." Some of the participants appeared unsure of which meat products are considered heart-healthy. One participant stated, 'I don't know what's healthy." Another participant stated, "I don't think any meat is healthy." A third participant replied, "Anything but red meat I think."

The participants were asked which types of dairy products they thought were the healthiest choices for the heart, 4 participants mentioned skim milk, 2 participants stated low-fat cheese, and 1 participant replied with "low-fat everything." Two of the participants appeared to be misinformed of heart healthy dairy products by stating, "All milk is bad for you" and "dairy isn't good." A third participant rejected milk specifically by replying, "I don't drink milk…I don't like it."

The last question the focus groups were asked was which types of fats they thought were healthiest for the heart. Four participants replied that olive oil was heart healthy and 2 participants said canola oil. One participant stated, "Spray butter is supposed to be healthy for you." Three of the participants appeared to be misinformed regarding fat. One participant commented, "Fat is not healthy." Another participant replied with, "I use butter, even though it's bad." A third participant reluctantly responded, "Margarine has less fat than butter…I think."

Discussion

The food choices of 52 participants from a senior nutrition program were examined in this study. Sixteen of the 52 participants participated in focus group sessions. Percentages, frequencies, ranking, and a non-parametric statistical analysis were used to evaluate the results of the questionnaire. Common responses emerged based on the participants' answers to the focus group sessions.

Overall, participants were able to identify foods associated with cardiovascular health. Research shows a variety of nutrients play a role in the protection against age-related diseases, such as cardiovascular disease. Key nutrients associated with cardiovascular health include fiber, potassium, omega-3 fatty acids, and the antioxidant vitamins C, E, B, and A. The common foods in which the nutrients are found include whole grains, fresh fruits and vegetables, low-fat dairy products, lean meats, and unsaturated fats (Meydani, 2001). The most frequently identified heart healthy food choices among participants were whole wheat bread, broccoli, skim milk, salmon, low-fat cottage cheese, orange

juice, apples, olive oil, tuna, chicken breast, and skinless turkey. These foods are consistent with the key nutrients known to promote heart health.

A greater percentage of males compared to females identified whole wheat bread, skim milk, salmon, and tuna. Ninety-two percent of males and 87 percent of females identified whole wheat bread, 92 percent of males and 72 percent of females identified skim milk, 85 percent of males and 67 percent of females identified salmon, and 85 percent of males and 69 percent of females identified tuna as heart healthy. A greater percentage of females compared to males identified broccoli, chicken breast, olive oil, and orange juice. Eighty-seven percent of females and 77 percent of males identified broccoli, 79 percent of females and 69 percent of males identified chicken breast, 72 percent females and 62 percent of males identified olive oil and 69 percent of females and 62 percent of males identified orange juice as heart healthy. However, results from the chi-square test determined there was not a statistically significant difference in the food choices among the male and female participants.

Previous research showed women tend to choose more fruit, yogurt, salads, milk, and high-fat sweets (Bates, et al., 1999 and Lindmark, et al., 2005). In this research, an equal percentage of males and females (48%) were able to identify the heart healthy fruits. Fifty-four percent of males and females chose low-fat yogurt, but a slightly greater percentage of females (28%) compared to males (23%) chose regular yogurt. A greater percentage of females (64%) compared to males (54%) selected spinach. Eighty-seven percent of females and 77 percent of males chose broccoli. A greater percentage of males (92%) compared to females (72%) chose skim milk. A greater percentage of females

(3%) compared to males (0%) selected doughnuts, as well as a greater percentage of females (8%) compared to males (0%) selected a regular muffin. Past research and this research are in some ways comparable. More females compared to males chose regular yogurt, salads, and high-fat sweets. However, and equal percentage of females and males chose heart healthy fruits and low-fat yogurt. A greater percentage of males compared to females chose skim milk, but a greater percentage of females compared to males chose whole milk.

Past research indicated men tend to choose more meat, saturated fat, and white breads (Mukamal, et al., 2006 & Femyhough, et al., 1999). Past research and this research are some ways similar. A greater percentage of males (69%) compared to females (56%) chose lean beef. However, 79 percent of females compared to 69 percent of males chose chicken breast. A greater percentage of males (15%) compared to females (0%) chose coconut oil, but a greater percentage of females (8%) compared to males (0%) selected butter. A larger percentage of females (3%) compared to males (0%) choose white bread.

Results from previous research and the results from this study are in some ways comparable. On average, 59 percent of males and 58 percent of females were able to identify heart healthy grains. A slightly greater percentage of females (57%) compared to males (54%) were able to identify the heart healthy vegetables. A greater percentage of males (65%) compared to females (57%) were able to identify heart healthy dairy items. A slightly greater percentage of females (58%) compared to males (56%) identified heart healthy meats. A greater percentage of males (46%) compared to females (42%) identified heart healthy

fats. A greater percentage of males (60%) compared to females (37%) identified heart healthy seafood.

A greater percentage of white participants compared to black participants were able to identify apples, tomatoes, lean beef, olive oil, and almonds. Seventy-six percent of white participants and 57 percent of black participants identified apples, fifty-four percent of white participants and 43 percent of black participants identified tomatoes, 63 percent of white participants and 29 percent of black participants chose lean beef, 71 percent of white participants and 57 percent of black participants identified olive oil, and 37 percent of white participants and 29 percent of black participants chose almonds as heart healthy. A greater percentage of black participants (100%) compared to white participants (90%) were able to identify whole wheat bread. Eighty-six percent of black participants compared to 54 percent of white participants chose bananas. Seventy-one percent of black participants compared to 61 percent of white participants identified spinach. Seventy-one percent of black participants and 37 percent of white participants selected beets. Eighty-six percent of black participants compared to 68 percent of white participants chose salmon. However, results of the chi-square test revealed there was not a statistically significant difference in food choices between the black and white participants

According to research conducted by Bell, et al. (2003) white individuals chose more vegetables, unsaturated fats, dark bread, and skim milk. In the Older Adults' Food Choices Associated with Cardiovascular Health study, a greater percentage of black participants compared to white participants chose the heart healthy vegetables with the exception of tomatoes. Forty-three percent of black

participants compared to 54 percent of white participants chose tomatoes. A greater percentage of white participants (71%) compared to black participants (57%) chose olive oil. Sixty-three percent of white participants compared to 29 percent of black participants chose canola oil. A greater percentage of black participants (100%) compared to white participants (90%) chose whole wheat bread. Fifty-seven percent of black participants compared to 44 percent of white participants selected brown rice. Eighty-six percent of black participants compared to 80 percent of white participants chose skim milk. This research study does not support Bell, et al. (2003) research that white individuals chose more vegetables, dark breads, and skim milk. However, in this research a greater percentage of white participants compared to black participants selected unsaturated fats which support Bell, et al. (2003) research.

James (2004) and Kittler and Sacher (2001) reported that black individuals tend to choose high fat foods, chicken, pork, and organ meats, as well as have a low intake of fruits and vegetables. A greater percentage of black participants (14%) compared to white participants (2%) selected doughnuts. A greater percentage of black participants (29%) compared to white participants (2%) chose a regular muffin. A hundred percent of black participants compared to 76 percent of white participants chose chicken breast; however, 27 percent of white participants and 2 percent of black participants chose pork. Eighty-six percent of black participants chose liver as a heart healthy meat product despite its high cholesterol content. This research does support past research by James (2004) and Kittler and Sacher (2001) that black individuals chose high fat foods, chicken,

and organ meats; however, in this study a larger percentage of white participants compared to black participants chose pork.

In this research, fifty-six percent of white participants and 61 percent of black participants identified the heart healthy grains. Sixty-eight percent of black participants compared to 57 percent of white participants chose heart healthy fruits, as 56 percent of black participants compared to 43 percent of white participants selected the heart healthy vegetables. A greater percentage of black participants (71%) compared to white participants (58%) were able to identify heart healthy dairy products. Sixty percent of both black and white participants were able to identify heart healthy meats. A slightly greater percentage of white participants (44%) compared to black participants (40%) identified heart healthy fats. Although, a greater percentage of black participants (57%) compared to white participants (42%) could identify heart healthy seafood items.

A greater percentage of participants with known cardiovascular disease (97%) compared to participants without known cardiovascular disease (65%) identified whole wheat bread. Ninety-four percent of participants with known cardiovascular disease compared to 65 percent of participants without known cardiovascular disease chose broccoli. Skim milk was identified by 77 percent of participants with known cardiovascular disease and 65 percent of participants without known cardiovascular disease. Eighty percent of participants with known cardiovascular disease chose chicken breast compared to 65 percent of participants without known cardiovascular disease. Eighty-three percent of participants with known cardiovascular disease compared to 59 percent of participants without known cardiovascular disease identified salmon. However,

results from the chi-square test indicated there was not a statistically significant difference between the food choices of participants with and without known cardiovascular disease.

Research regarding the difference in food choices among those who have and those who do not have known cardiovascular disease shows that those with known cardiovascular disease tend to choose more eggs, red meat, fat/butter, and sweets (Loke & Chan, 2005). This research shows a greater percentage of participants with known cardiovascular disease selected the healthier types of meats and fats. Participants with known cardiovascular disease (60%) compared to those participants without known cardiovascular disease (47%) identified lean beef as heart healthy. Pork tenderloin was chosen among 34 percent of participants with known cardiovascular disease and among 5 percent of participants without known cardiovascular disease as a heart healthy meat. A slightly greater percentage of participants with known cardiovascular disease (69%) compared to participants without known cardiovascular disease (64%) chose olive oil as heart healthy. Canola oil was selected among 65 percent of participants with known cardiovascular disease and among 41 percent of participants without known cardiovascular disease as heart healthy. In addition, this research show a small percentage of participants with known cardiovascular disease selected sweets, as three selected doughnuts and nine percent chose a regular muffin as heart healthy. This research does not support Loke and Chan's (2005) research that individuals with cardiovascular disease chose more red meat, fat/butter, and sweets.

However, research shows there is an apparent lack of adherence to diets which are low in fat and high in fruit and vegetables intake in individuals with known cardiovascular disease (Neuhouser, et al., 2002). Although lack of adherence may be a reason to the development of cardiovascular disease, this research shows limited variety in heart healthy foods, which suggests that a limited selection of heart healthy foods could be a contributing reason to cardiovascular disease as well.

During the focus group sessions, the older adults identified foods within the bread, fruit, and vegetable group that are considered to be heart healthy. The researcher noticed the participants did not give a wide variety of foods within the bread group, but did give a variety of fruits and vegetables associated with heart health. Participants did not give a wide variety of heart health dairy, meat, fat, or seafood items. In fact, some of the participants appeared to be confused or misinformed on heart healthy dairy, meats, and fats.

During the focus group session, the researcher was looking for specific bread and grain products such as oatmeal, whole grain pasta, brown rice, and whole grain cereals such as Cheerios, Raisin Bran, or Total. Deep colored fresh fruits and vegetables such as berries, apples, oranges, spinach, tomatoes, green peppers, and carrots would have been acceptable answers for heart healthy fruits and vegetables. Low fat yogurt, skim or 1% milk, low-fat cheese such as part-skim mozzarella or ricotta, and soy milk would have been acceptable answers as well for heart healthy dairy products. The researcher was looking for specific meats and fish associated with heart healthy such as chicken or turkey without the skin, lean beef, lean pork, salmon, tuna, or mackerel. Unsaturated fats such as

olive oil, canola oil, peanut butter, almonds, avocados, and sunflower seeds would have been acceptable answers in regards to heart healthy fats.

The participants within this study were able to identify heart healthy foods; however, their choices were similar regardless of being male, female, white, black, and with or without cardiovascular disease. The following section focuses on the summary, limitations, recommendations, and conclusion of this study.

Chapter 5

Summary, Limitations, Recommendations, and Conclusion

The number of older adults who develop cardiovascular disease continues to remain high (American Heart Association Statistical Update, 2006). The purpose of the study was to identify the food choices older adults associate with cardiovascular health. The questionnaire was distributed to older adults involved with a senior nutrition program to determine food choices they associate with heart health. Fifty-two individuals served as participants in this study. The data from the questionnaire were quantitatively analyzed using Microsoft Excel and GraphPad Software. Common responses from the focus groups were identified and reported with the help of a Registered Dietitian.

Summary

Results show that when given a list of foods, participants accurately identified heart healthy foods. Results of chi-square tests revealed the food choices did not significantly differ between males and females, between races, or between those with and without known cardiovascular disease.

There were slight differences in the heart healthy food choices between male and female participants. A greater percentage of the male participants compared to female identified heart healthy grains, dairy, meats, fats, and seafood. A greater percentage of female compared to male participants identified the heart healthy fruits and vegetables. However, results of the chi-square test revealed there was not a statistically significant difference between the food choices of the male and female participants.

There were observable differences in the heart healthy food choices between black and white participants. A greater percentage of black participants compared to white participants identified heart healthy grains, fruits, vegetables, dairy, and seafood. A greater percentage of white participants compared to black participants identified heart healthy fats. An equal percentage of white and black participants identified heart healthy meats. However, there was not a statistically significant difference between the food choices of white and black participants according to the results the chi-square test.

There were slight differences in the heart healthy food choices between participants with and without known cardiovascular disease. A greater percentage of participants with known cardiovascular disease identified the heart healthy grains, fruits, vegetables, dairy, meats, fats, and seafood. However, results from the chi-square test revealed there was not a statistically significant difference in food choices between participants with and without known cardiovascular disease.

The participants were asked the same questions that were on the questionnaire during the focus group sessions. The qualitative results showed the participants were able to name heart healthy foods from the bread group, fruit group, and vegetable group. There was not much variety given within the grains group, as whole wheat bread and whole grains were common responses. The participants gave a large variety of heart healthy fresh fruits and vegetables; however, canned and frozen fruits and vegetables were not mentioned as much. A few of the participants appeared to be either unsure or misinformed of foods considered to be heart healthy in the meat, dairy, and fats and oils group.

Limitations

Limitations included a convenience sample, sample size, and limited time. The convenience sample consisted of participants involved in a senior nutrition program. Sample size was a limitation due to the number of older adults who participated in the senior nutrition program. Given these limitations, generalized assumptions regarding all older adults' food choices associated with heart health cannot be made. In addition, this research study was part of a graduate-level thesis; therefore, the time to complete the study was limited.

Recommendations for Research

Further studies on food choices associated with cardiovascular disease are needed. Since there was limited available research on food choices of older adults, future research on food choices of males, females, white and black individuals, and individuals with and without known cardiovascular disease should be explored. Future studies are needed to determine if the studies support or contradict the results of the Older Adults' Food Choices Associated with Cardiovascular Health study. Due to the prevalence of cardiovascular disease among older adults, it would be helpful to examine the current dietary intake of older adults compared to their knowledge and attitudes behind heart healthy foods. Such future studies could examine the reasons behind choosing or not choosing to eat heart healthy foods such as preference, convenience, cost, or access.

It is recommended that future studies explore the types of foods the older population are consuming and compare the foods to heart healthy foods and attitudes towards heart healthy foods. Once researchers identify the problems,

proper education can be implemented to help older adults choose heart healthy foods and hopefully improve the quality of lives by minimizing the risk for cardiovascular disease.

Recommendations for Practice

Future practice should focus on educating the older population. As mentioned, during the focus group when the participants were not given a list of foods they appeared to be either unsure or misunderstood what is considered to be heart healthy. As one participant stated, "I don't know what's healthy" in reference to the meat group. As another participant replied "Milk is bad for you," referring to the dairy group. A third participant replied with, "Fat is not healthy" in reference to the fats and oils group. These statements suggest that some older adults are confused or mislead in certain aspects of nutrition. Nutrition educators should clarify nutrition misconceptions and emphasize that food groups should not be restricted. A second recommendation includes educating older adults on eating a variety of heart healthy foods, which can be incorporated into their every day diet. A third recommendation includes emphasizing the importance of having foods older adults enjoy while continuing to be conscious of their own heart health.

Conclusion

According to Wahlqvist and Savige (2000), assessing knowledge is a practice used to identify older adults' ability to choose health-promoting foods. This study focused on food choices older adults associate with cardiovascular health. Past research indicates appropriate food choices by the older adult

population is an essential factor in maintaining health and influencing the incidence of age-associated diseases (Souter & Keller, 2002).

It was determined that when given a questionnaire of foods from each food category, the older adults appeared to choose several of the same heart healthy of foods regardless of sex, race, or cardiovascular health. Their choices were accurate, but limited. Evidence indicates that a significant number of elderly fail to get the amounts and types of food necessary to meet essential nutrient needs (Russell, et al., 1999 & U.S Department of Health and Human Services, 2005).

Providing nutrition education to the older population would supply older adults with the knowledge that consuming foods from all food groups is essential for heart health. According to past research which focused on health behavior, older adults ages 70 to 89 reported confusion about how to stay healthy. The older adults also had a higher level of uncertainty regarding which foods to eat compared to the younger respondents ages 50 to 69 (Ferrini, et al., 1994). Nutrition education may be helpful to clarify nutrition misconceptions. Making appropriate food choices is the first step toward improving dietary intake and is directly related to nutritional well being (Souter & Keller, 2002). Proper nutrition in the later years can help lessen the effects of diseases prevalent among older adults and improve the quality of life in people who have such diseases (Kurtzwell, 2007).

References

American Heart Association. Fish and Omega-3 Fatty Acids. Retrieved July 14, 2006, from www.americanheart.org/presenter.jhtml?identifier=4632.

American Heart Association. Statistical Update 2006. Retrieved May 16, 2006, from www.americanheart.org/presenter.jhtml?identifier=3038611.

Appel, L. J., Moore, T. J., Obarzanek, E. O., Vollmer, W. M., Svetkey, L. P., Sacks, F. M., Bray, G. A., Vogt, T. M., Cutler, J. A., Windhauser, M. M., Lin, P., Karanja, N., Simons-Morton, D., McCullough, M., Swain, J., Steele, P., Evans, M. A., Miller E. R., & Harsha, D. W. (1997). A clinical trial of the effects of dietary patterns on blood pressure. *New England Journal of Medicine*, *336*(16), 1117-1124.

Arthinan, N. T., Myer-Schim, S., Vander, J. S., & Nies, M. A. (2004). Eating patterns and cardiovascular disease risk in a Detroit Mexican population. *Public Health Nursing, 21*(5), 425-434.

Bailey, R. L., Mitchell D. C., Miller C. K., Still C. D, Jensen G. J., Tucker K. L, & Smiciklas H. (2007). A dietary screening questionnaire identifies dietary pattern in older adults. *Journal of Nutrition, 137,* 421-426.

Bates, C. J., Prentice A., & Finch S. (1999). Gender differences in food and nutrient intakes and status indices from the National Diet and Nutrition Surveys of People Aged 65 Years and Over. *European Journal of Clinical Nutrition*, *53*(9), 694-699.

Bell, R. A., Vitolins, M. Z., Arcury T. A., & Quandt, S. A. (2003). Food comparison of rural older African Americans, Native Americans, and white adults in North Carolina. *Journal of Nutrition for the Elderly, 23*(2), 1-16.

Bostick, R. M., Kushi, L. H., Wu, Y., Meyer, K. A., Sellers, T. A., & Folsom, A. R. (1999). Relation of calcium, vitamin D, and dairy food intake to ischemic heart disease mortality among postmenopausal women. *American Journal of Epidemiology, 149*(2), 151-161.

Buonopane, G. J., Kilara, A., Smith, J. S., & McCarthy, R. D. (1992). Effect of skim milk supplementation on blood cholesterol concentration, blood pressure, and triglycerides in a free-living human population. *Journal of American College of Nutrition, 11*(1), 56–67

Centers for Disease Control and Prevention. Division for Heart Disease and Stroke Prevention. Retrieved May 20, 2006, from www.cdc.gov/nccdphp/publications/aag/cvh.htm.

Djousse, L., Arnett, D. K., Coon, H., Province, M. A., Moore, L. L., & Ellison, R. C. (2004). Fruit and vegetable consumption and LDL cholesterol: The National Heart, Lung, and Blood Institute Family Heart Study. *American Journal of Clinical Nutrition, 79*(2), 213-217.

Djousse, L., Pankow, J. S., Hunt, S. C., Heiss, G., Province, M. A., Kabagambe, E. K., & Ellison, R. C. (2006). Influence of saturated fat and linolenic acid on the association between intake of dairy products and blood pressure. *Hypertension, 47*(6), 342-348.

Fernyhough, L. K., Horworth C. C., Campbel A. J., Robertson M. C., & Busby W. J. (1999). Changes in dietary intake during a 6 year follow-up of an older population. *European Journal of Clinical Nutrition, 53*(3), 216-225.

Ferrini, R., Edelstein, S., & Barrett-Connor, E. (1994). The association between health beliefs and health behavior change in older adults. *Preventive Medicine, 23*(1), 1-5.

Gutterman, D. D. (2001). Heart disease can be a silent killer. Retrieved May 3, 2007, from http://healthlink.mcw.edu/article/942430653.html.

Hargreaves M .L., Schlundt D. G., & Buchowski M. S. (2002). Contextual factors influencing the eating behaviors of African American women: A focus group investigation. *Health & Ethnicity, 7*(3), 133-147.

Health Guidance. (2007). Older adults: The facts. Retrieved September 18, 2007 from www.healthguidance.org/entry/6319/1/Older-Adults-The-Facts.html.

Hodes, R. J. (2007). Aging Hearts and Arteries: A Scientific Quest. Retrieved October 7, 2007, from www.nia.nih.gov/HealthInformation/Publications/AgingHeartsandArteries/

Hu, F. B. (2003). Plant-based foods and prevention of cardiovascular disease: An overview. *American Journal of Clinical Nutrition, 78*(3), 544-551.

Hu, F. B, Bronner, L. B., Willett, W. C., Stampfer, M. J., Rexrode, K. M, Albert, C. M., Hunter, D., & Mason, J. E. (2002). Fish and omega-3 fatty acid intake and risk of coronary heart disease in women. *Journal of the American Medical Association, 287*(14), 1815-1821.

Hu, F. B., Stampfer, M. J., Manson, J. E. (1999). Dietary intake of alpha-linolenic acid and risk of fatal ischemic heart disease among women. *American Journal of Clinical Nutrition, 69*(5), 890-897.

Hu, F. B., Stampfer, M. J., Manson, J. E., Ascherio, A., Colditz, G. A, Speizer, F. E., Hennekens, C. H, & Willett, W. C. (1999). Dietary saturated fats and their food sources in relation to the risk of coronary heart disease in women. *American Journal of Clinical Nutrition, 70*(6), 1001-1008.

Hu, F. B., Stampfer, M. J., Manson, J. E., Rimm, E., Colditz, G. A., Rosner, B. A., Hennekens, C. H, & Willett, W. C. (1997). Dietary fat intake and the risk of coronary heart disease in women. *New England Journal of Medicine, 337*(21), 1491-1499.

Jacobs, D. R. Jr., Meyer, K. A., Kushi, L. H., & Folsom, A. R. (1998). Whole-grain intake may reduce the risk of ischemic heart disease death in postmenopausal women: The Iowa Women's Health Study. *American Journal of Clinical Nutrition, 68*(2), 248-257.

James, D. (2004). Factors influencing food choices, dietary intake, and nutrition-related attitudes among African-Americans: Application of cultural sensitivity model. *Health & Ethnicity, 9*(4), 349-367.

Jensen, M. K., Koh-Banerjee, P., Hu, F. B., Franz, M., Sampson, L., Gronbaek, M., & Rimm, E. B. (2004). Intakes of whole grains, bran, and germ and the risk of coronary heart disease in men. *American Journal of Clinical Nutrition, 80*(6), 1492-1499.

Joshipura, K. J., Ascherio, A., Manson, J. E. (1999). Fruit and vegetable intake in relation to risk of ischemic stroke. *Journal of the American Medical Association, 282*(13), 1233-1239.

Kerver, J. M., Yang, E. J., Bianchi, L., & Song, W. O. (2003). Dietary patterns associated with risk factors for cardiovascular disease in healthy US adults. *The American Journal of Clinical Nutrition, 78*(6), 1103-1110.

Kittler P. G., & Sucher K. P. (2001). *Food and Culture,* 3rd Edition. Wadsworth, Standford, CT.

Knekt, P., Reunanen, A., Jarvinen, R., Seppanen, R., Heliovaara, M., & Aromaa, A. (1994). Antioxidant vitamin intake and coronary mortality in a longitudinal population study. *American Journal of Epidemiology, 139*(12), 1180-1189.

Kuczmarski, M. F., Kuczmarski, R. T., & Najjar, M. (1995). Food usage among Mexican Americans, Cuban, and Puerto Rican Adults. *Nutrition Today, 30*(1), 30-37.

Kurtzwell, P. (2007). Nutrition and Aging. Retrieved September 30, 2007 from www.seekwellness.com/nutrition/aging.htm

Lampe, J. W. (1999). Health effects of vegetables and fruit: Assessing mechanisms of action in human experimental studies. *American Journal of Clinical Nutrition, 70*(3), 475S-490S.

Lindmark, U., Stegmay, B., Nilsson, B., Lindahl, B., & Johansson, I. (2005). Food selection associated with sense of coherence in adults. *Nutrition Journal, 4,* 9.

Loke, A. Y. & Chan, K. N. (2005). Dietary habits of patients with coronary atherosclerosis: Case-control study. *Journal of Advanced Nursing, 52*(2), 159-169.

Liu, S., Manson, J. E., Lee, I., Cole, S. R., Hennekens, C. H., Willett, W. C., & Buring, J. E. (2000). Fruit and vegetable intake and risk of cardiovascular disease: The Women's Health Study. *American Journal of Clinical Nutrition, 72*(4), 922-928.

Liu, S., Stampfer, M. J., & Hu, F. B. (1999). Whole-grain consumption and risk of coronary heart disease: Results from the Nurse's Health Study. *American Journal of Clinical Nutrition, 7*(3), 412-419.

Marckmann, P., & Gronbaek, M. (1999). Fish consumption and coronary heart disease mortality. A systematic review of prospective cohort studies. *European Journal of Clinical Nutrition, 53*(8), 585-590.

Marlett, J. A., McBurney, M. I., & Slavin, J. L. (2002). Position of the American Dietetic Association: Health implications of dietary fiber. *Journal of the American Dietetic Association, 102*(7), 993-1000

Meydani, M. (2001). Nutrition interventions in aging and age-associated disease. *Annals of the New York Academy of Sciences, 928,* 226-235.

Michels, K. B., & Wolk, A. (2002). A prospective study of variety of healthy foods and mortality in women. *International Journal of Epidemiology, 31*(4), 847-854.

Mokada, A. H., Ford, E. S., Bowman, B. A., Dietz W. H., Vinicor, F., & Bales, V. S. (2003). Prevalence of obesity, diabetes, and obesity related health risk factors. *Journal of American Medical Association, 289*(8), 76-79.

Mozaffarian, D., Ascherio, A., Hu, F. B., Stampfer, M. J., Willett, W. C., Siscovick, D. S. & Rimm, E. B. (2005). Interplay between different polyunsaturated fatty acids and risk of coronary heart disease in men. *Circulation, 111,* 157-164.

Mozaffarian, D., Bryson, C. L., Lemaitre, R. N., Burke, G. L., & Siscovick, D. S. (2005). Fish intake and risk of heart disease. *Journal of the American College of Cardiology, 45*(12), 2015-2021.

Mozaffarian, D., Kumanyika, S. K., Lemaitre, R. N., Olson, J. L., Burke, G. L., & Siscovick, D. S. (2003). Cereal, fruit, and vegetable fiber intake and the risk of cardiovascular disease in elderly adults. *Journal of the American Medical Association, 289*(13), 1659-1666.

Mukamal K. J., Chung H., Jenny N. S., Kuller L. H., Longstreth W. T. Jr., & Mittleman M. A., Burke, G. L., Cushamn, M., Psaty, B. M., & Siscovick, D. S. (2006). Alcohol consumption and risk of coronary heart disease in older adults: The Cardiovascular Health Study. *Journal of the American Geriatrics Society, 54*(1), 30-37.

National Heart Foundation. Retrieved July 5, 2006, from www.heartfoundation.com.

National Heart, Lung and Blood Institute. TLC Diet: Daily Food Guide Food Groups. Retrieved July 11, 2006, from http://nhlbisupport.com/chd1/S2Tipsheets/dairy.htm.

Nestel, P. J. (2002). Cardiovascular disease. *The Medical Journal of Australia, 176*(11), S118-S119.

Neuhouser, M. L., Miller, D. L., Kristal, A.R, Barnett, M. J, & Cheskin, L. J. (2002). Diet and exercise habits of patients with diabetes, dyslipidemia, cardiovascular disease or hypertension. *Journal of the American College of Nutrition, 21*(5), 394-401.

Pareo-Tubbeh, S. L., Romero L. J., Baumgartner, R. N., Garry, P. J., Lindeman, R. D., & Koehler, A. M. (1999). Comparison of energy and nutrient sources of elderly Hispanic and non-Hispanic white in New Mexico. *Journal of the American Dietetic Association, 99*(5), 572- 582.

Russell, R. M., Rasmussen, H., & Lichtenstein, A. H. (1999). Modified food guide pyramid for people over seventy years of age. *Journal of Nutrition, 129*(3), 751-753.

Sahyoun, N. R., Jacques, P. F., Zhang, X. L., Juan W., & McKeown, N. M. (2006). Whole-grain intake is inversely associated with the metabolic syndrome and mortality in older adults. *American Journal of Clinical Nutrition, 83*(1), 124-131.

Seal, C. J. (2006). Whole grains and cardiovascular disease risk. *The Proceedings of the Nutrition Society, 65*(1), 24-34.

Shatenstein B., Payette H., Nadon S., & Gray-Donald K. (2003). An approach for evaluating lifelong intakes of functional foods in elderly people. *Journal of Nutrition, 133*(7), 2384-2391.

Souter, S., & Keller, C. S. (2002). Food choice in the rural dwelling of older adult. *Southern Online Journal of Nursing Research, 5*(3).

St-Onge, M. P., Farnworth, E. R., & Jones, P. J. (2000). Consumption of fermented and nonfermented dairy products: Effects on cholesterol concentrations and metabolism. *American Journal of Clinical Nutrition, 71*(3), 674-681.

Sundquist, J., & Winkleby, M. A. (1999). Cardiovascular risk factors in Mexican American adults: A transcultural analysis of NHANES III, 1988-1994. *American Journal of Public Health, 89*(5), 723-730.

Trichopoulou, A., Kouris-Blazos, A., Wahlqvist, M. L., Gnardelli, C., Lagiou, P., Polychronopoulos, E., Vassilakou, T., Lipworth, L., & Tichopoulou, D. (1995). Diet and overall survival in elderly people. *British Medical Journal, 311*, 1457-1460.

Tucker, K. L., Mahnken, B., & Selhub, J. (1996). Folic acid fortification of the food supply. *Journal of the American Medical Association, 276*(23), 1876-1885.

Tucker, K. L. & Rush, D. (1992). *Food choices of the elderly: Nutrition in the Elderly*. London: Smith-Gordon Nishimura.

Tucker, K. L., Selhub, J., Wilson, P. W., & Rosenberg, I. H. (1996). Dietary intake patterns relates to plasma folate and homocysteine concentration in the Framingham Heart Study. *Journal of Nutrition, 126*(12), 3025-3031.

U.S. Census Bureau. National population projections. Retrieved May 17, 2006, from www.census.gov/population/www/projections/natproj.html.

U.S Department of Agriculture. (2000). Facts about nutrition and health. Retrieved July 7, 2006, from www.saltinstitute.org/usda-facts.html.

U.S. Department of Health and Human Services. (2000). Healthy People 2010: Conference Edition, 2 vols, US Public Health Service, Washington, DC.

U.S. Department of Health and Human Services. Heart and Cardiovascular Disease. (2002). Retrieved February 12, 2006, from www.4women.gov.

U.S. Department of Health and Human Services. Heart Disease. (2007). Retrieved March 5, 2007 from www.4women.gov/faq/heartdis.htm.

U.S. Department of Health and Human Services. Healthier Older Adults. (2005). Retrieved September 30, 2007 from www.health.gov/dietaryguidelines/dga2005/healthieryou.

Wahlqvist, M. L., & Savige, G. S. (2000). Interventions aimed at dietary and lifestyle changes to promote healthy aging. *European Journal of Clinical Nutrition, 54*(3),148-156.

Warde J., Haase A.M., Steptoe A., Nillapun M., Jonwotiwes K., & Bellisle A. (2004). Gender differences in foods choices; the contribution of health beliefs and dieting. *Annual of Behavioral Medicine, 2*(2), 107-116.

Woo, J. (2000). Relationships among diet, physical activity, and other lifestyle factors and debilitating diseases in the elderly. *European Journal of Clinical Nutrition*, *54*(3), S143-S147.

World Health Organization. Cardiovascular Disease. (2007). Retrieved September 18, 2007 from www.who.int/cardiovascular_diseases/en/.

World Health Organization. Cardiovascular Disease: Prevention and Control. Retrieved February 12, 2006, from www.who.int/dietphysicalactivity/publications/facts/cvd.

Zampelas, A., Panagiotakos, D. B., Pitsavos, C., Das, U. N., Chrysohoou, C., Skoumas, Y., & Stefanadis, C. (2005). Fish consumption among healthy adults is associated with decreased levels of inflammatory markers related to cardiovascular disease: the ATTICA study. *Journal of the American College of Cardiology, 46*(1), 120-124.

Appendix A

Questionnaire

This questionnaire is part of a graduate-level thesis. Your participation is voluntary and all personal data obtained from this questionnaire will be kept confidential. There are no foreseeable risks to completing this questionnaire. Although there are no direct benefits, your participation contributes to a thesis research study. If you agree to participate in this study, please circle your answers for each question to the best of your ability.

1. Are you? (Circle)

   Male or Female

2. What is your race? (Circle)

   White Black Hispanic Indian

   Other (stating is optional) _____

3. Which group does your age belong? (Circle)

   55-65 66-75 76-85 86-95 96 and older

4. Do you have any of the following cardiovascular (heart) diseases or experienced any of the following cardiovascular (heart) events? (Circle)

   Coronary artery disease

   Coronary heart disease

   Heart failure

   Atherosclerosis

   High blood pressure

   Heart Attack

   Stroke

   Aneurysm

   Other (listing is optional) _____

   No, these do not apply to me

5. Which of the following is the highest level of education you have completed? (Circle)

   None Grammar School High School College

   Master's Degree Doctoral Degree Professional Studies

Out of the list of foods, which do you think are the best choices to consume for heart health? For questions 6-12, you may circle more than one answer.

6. Which types of bread products are the healthiest for the heart?

A. White bread
B. Whole wheat bread
C. Crackers
D. White rice
E. Brown rice
F. Plain Oatmeal
G. Doughnuts
H. Egg noodles
I. Whole grain pasta
J. Regular Muffin

7. Which types of fruits, fruit juices, are the healthiest for the heart?

A. Coconut
B. Canned pears in syrup
C. Strawberries
D. Banana
E. Canned oranges in syrup
F. Grape juice
G. Orange juice
H. Canned peaches in juice
I. Blueberries
J. Apples

8. Which types of vegetables are the healthiest for the heart?

A. Iceberg lettuce
B. Tomato
C. Canned corn
D. Spinach
E. Dill pickle
F. Broccoli
G. Sauerkraut
H. Garlic
I. Beets
J. Canned peas

9. Which types of dairy products are the healthiest for the heart?

A. Skim milk
B. Regular yogurt
C. Ice cream
D. Whole Milk
E. Low-fat cottage cheese
F. Low-fat yogurt
G. Regular sour cream
H. Regular cottage cheese
I. Low-fat cheese
J. Low-fat sour cream

10. Which types of meat products are the healthiest for the heart?

A. Bacon
B. Chicken breast
C. Sausage
D. Lean Beef
E. Liver
F. Fried chicken
G. Skinless turkey
H. Hot dogs
I. Pork tenderloin
J. Bologna

11. Which types of fats are the healthiest for the heart?

A. Coconut oil
B. Olive oil
C. Butter
D. Margarine
E. Canola Oil
F. Lard
G. Almonds
H. Corn oil
I. Peanut butter
J. Shortening

12. Which types of seafood are the healthiest for the heart?

A. Tuna
B. Lobster
C. Fried catfish
D. Salmon
E. Fried crab cakes
F. Mackerel
G. Breaded and fried shrimp
H. Cod
I. Breaded and fried calamari
J. Trout